Inadev's Proposal to MassTech for AI Hub Data Commons Collaborative Consulting Services

October 07, 2025

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1 Attachment A

1.1 Application Cover Sheet

Name of Respondent: Inadev Corporation			
Mailing Address: 11921 Freedom Drive, Suite 920, Reston, VA, 20190	**City/Town:** Reston	**State:** Virginia (VA)	**Zip Code:** 20190
Telephone: 7032860860	**Fax:** N/A	**Web Address:** https://www.inadev.com/	
Primary Contact for Clarification: Jitesh Sachdev		**Primary Contact E-mail Address:** sales-support@inadev.com	
Authorized Signatory: Jitesh Sachdev		**Authorized Signatory E-mail Address:** jitesh@inadev.com	
Legal Status/Jurisdiction: Corporation		**Respondents W-9:** 54-2018793 **Respondents UEI No.** G76WDNVMM3K3	

2 Executive Summary

Inadev Corporation is pleased to present this proposal in response to MassTech Collaborative's RFP No. 2026-JAII-01 for consulting services to design, develop, and operationalize the AI Hub Data Commons Collaborative (DCC). With over a decade of experience in delivering secure, scalable civic technology and innovative data platforms for federal, state, and nonprofit organizations, Inadev brings proven expertise in AI/ML, metadata-driven data governance, and government-grade compliance.

We understand that MassTech's vision for DCC is to create a trusted, statewide data hub that enables researchers, startups, educators, and agencies to discover, share, and generate datasets in ways that are transparent, ethical, and equitable. The Commonwealth seeks to establish not only a central data repository but also a collaborative ecosystem that supports synthetic data generation, fairness and bias monitoring, and a Commons Credits system to incentivize contributions. This initiative comes at a pivotal time when data-driven innovation must be balanced with privacy, accountability, and public trust.

At Inadev, we propose a configurable, cloud-native solution built with proven open-source frameworks and integrated AI/ML tools that deliver:

- A public-facing website and dataset directory with intuitive search, previews, and WCAG 2.1 accessibility compliance.
- Hosted data functionality supporting multiple formats (CSV, JSON, Parquet), APIs, versioning, and lineage tracking.
- A secure Commons Credits ledger that rewards contributors and ensures equitable access to premium resources.
- A metadata catalog aligned with standards such as Dublin Core and DCAT, with role-based publishing workflows and collaboration features.
- Synthetic data pipelines powered by SDV, Synthea, and CARLA for privacy-preserving innovation.
- Built-in bias detection and fairness dashboards using AIF360 and Fairlearn, with ethical review workflows and training modules.
- Governance and compliance workflows that align with HIPAA, anti-discrimination laws, and state/federal data-sharing policies.
- Enterprise-grade security with SSO, MFA, dataset tiering, encryption, IDS monitoring, and penetration testing.
- Ethical use guidelines embedded into practice through provenance documentation, consent management, and transparency dashboards.

Each capability is designed to align with the Commonwealth's mission to foster responsible AI innovation while protecting privacy, equity, and citizen trust.

Inadev has deep experience in building and modernizing data-driven civic platforms in high-stakes environments. We have successfully partnered with federal and state agencies, including the Licensing and Consumer Protection (DLCP), the International Anti-Counterfeiting Coalition, the National

Telecommunications and Information Administration (NTIA), Hughes, Special Olympics, the Massachusetts League of Community Health Centers (MLCHC), and the American Battle Monuments Commission (ABMC). Our expertise in data governance, compliance, and AI/ML integration positions us uniquely to deliver the DCC as a national model for responsible data collaboration.

An indicative **11-month timeline** has been proposed, covering design, development, dataset curation, governance setup, training, and go-live. Our development cost will be **$ 375,000** (provided separately in the Services Budget Template sheet).

Inadev is well-positioned to be MassTech's trusted partner for the AI Hub Data Commons Collaborative. Our combination of government experience, technical depth, and commitment to ethical AI makes us the strategic choice to build a future-ready data platform that delivers trust, transparency, and innovation for all Massachusetts stakeholders.

3 Company Profile

Based in Reston, VA, Inadev Corporation has a turnover of USD 30 million as of 2024 and over 13 years of experience at delivering successful projects to federal, state, and local government agencies, non-profits, and private sector clients across the globe. With a workforce of 600+ professionals distributed globally, across development centers in the USA, India, and Australia, Inadev offers deep expertise in mobile-first, cloud-native, human-centered application development, systems integration, maintenance, and program management that align with mission-critical objectives and drive long-term value for our clients. As a CMMI Level 5 organization, we adhere to the highest standards of process maturity and quality, ensuring consistent delivery excellence.

Headquartered in Freedom Drive, VA; with offices in India and Australia

Global FTE: 650+;
US: 110+; India: 500+

Consistent Year-on-Year growth of >40%

Attrition Rate:
US - <2%; India - <8%

CMMI level 3 appraised and ISO certified company*
*CMMI level 5 expected by 2025

Expert team has 1000+ years of combined experience

Executive leadership have expertise across industries (FS, Healthcare, IT, Telecom)

Serving clients in US, Canada, Australia, India Singapore and Middle East

Our development approach blends agile methodology, scalable architecture, and empathetic design to create robust, user-friendly, and business objective-aligned solutions. Whether modernizing legacy infrastructure or building digital platforms from the ground up, Inadev consistently delivers high-performing systems that are easy to maintain and adapt.

Inadev cultivates a culture akin to a university, fostering continuous learning and investing in research and development to deliver innovative solutions fueled by cutting-edge technology.

At Inadev, we foster a culture of giving back, encouraging our employees to dedicate their time and skills to community service and volunteering initiatives. Our "Inadev Cares" Program stands as an annual highlight, where employees rally together to raise funds supporting small NGOs.

We are honored to have been recognized as a Fairfax County Commuter Friendly Workplace honoree, a testament to our commitment to promoting sustainable commuting practices.

Furthermore, we are proud recipients of notable awards for mobile application innovation, including the ACT-IAC Mobile Application Innovation Champion Award in 2022 and the Department of Labor 2023 Federal Tech Day Best Increase in Mobile Productivity award. These honors demonstrate our commitment to delivering cutting-edge solutions that enhance productivity and innovation in mobile technology.

3.1 Areas of Expertise

Below, we outline our technical expertise, showcasing the skills and capabilities that form the foundation of our innovative solutions.

Next-Gen AI solutions

- Domain-specific Data science model implementation
- Computer Vision
- Gen AI Chatbot
- Personalized LLM Implementation
- Agentic Automation and RPA
- End-to-End RPA Deployment, Automation Maintenance and Support

Data Engineering and Analytics

- Data Engineering
- Data Management & Governance
- ELT & ETL | Integrations
- Databricks & Snowflake
- Data Warehouse | Data Storage
- Data Analytics, BI, Visualization

Cloud Solutions (AWS/Azure/GCP)

- Public, Hybrid, and Multi-cloud Solutions
- Cloud Strategy, Assessment, & Roadmap
- Cloud Security
- Cloud Application Migration
- 24/7 Cloud Managed Services

Digital Engineering

- Product Development
- Research & Development
- DevSecOps strategy & Migration roadmap
- API Integration, Agile
- Quality Engineering | Automation Suite | SRE | CI/CD
- UI | UX | Micro services

CRM Services

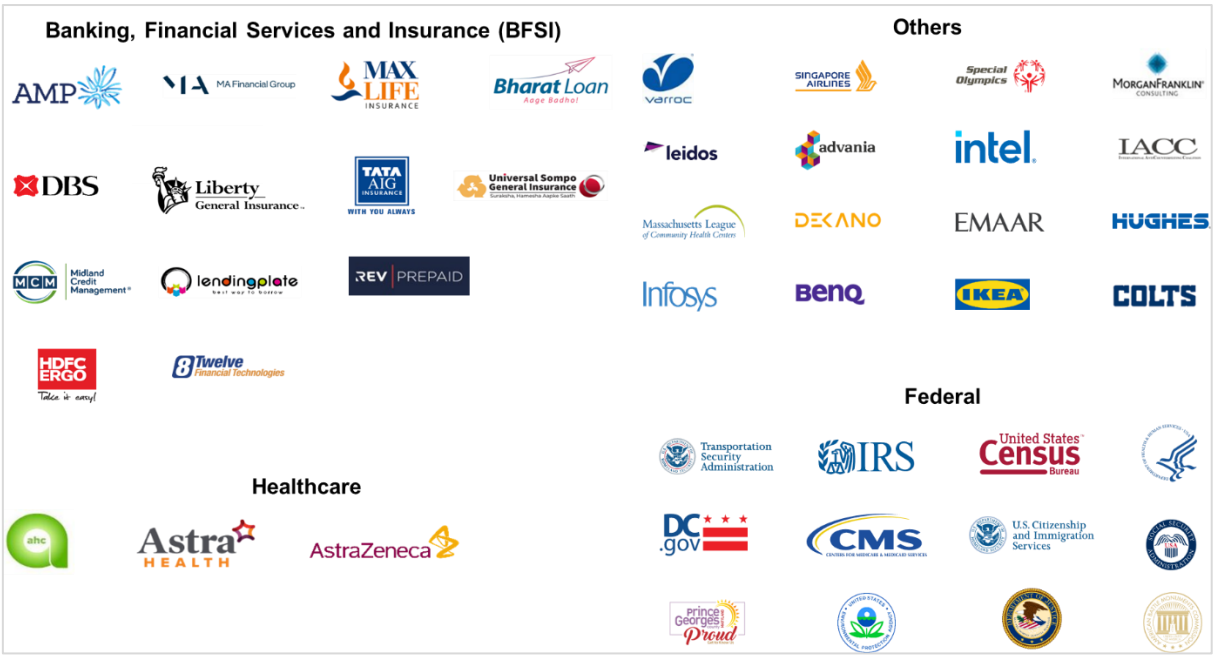
- MS Dynamics, Salesforce, Custom CRM, Zoho, Sugar CRM
- CRM assessment
- CRM Upgrades & Enhancements
- Consulting, Implementation, Operations, Transformation, & Support
- Configuration, Integration, Migration

IT Operations

- 24/7 L1, L2 and L3 application support
- 24/7 Cloud Infrastructure monitoring & support
- Disaster Recovery & Business Continuity Planning
- Ticket management, SLA based resolution
- Escalation matrix, Governance

3.2 Client Portfolio

Inadev has delivered impactful solutions across diverse sectors - including Government, BFSI, Healthcare, and Non-Profit - building lasting client relationships grounded in trust, innovation, and reliable execution.



We have a proven track record of delivering innovative, secure, and scalable impactful technology solutions across a diverse range of client organizations. Our deep understanding of mission-driven environments, combined with our agile development practices and commitment to being an 'AI-First' organization with a focus on user-centric design and innovation, has consistently enabled us to meet complex challenges with precision and reliability. From modernizing legacy systems to deploying cloud-native platforms, we tailor our approach to each client's unique needs while ensuring compliance, performance, and long-term sustainability. With Inadev, you gain a trusted partner with technical depth, domain knowledge, and delivery discipline to drive your initiative forward - on time and with measurable impact.

4 Our Understanding of Requirement

The Massachusetts Technology Collaborative, on behalf of the Massachusetts AI Hub, is seeking a qualified partner to design, develop, and launch the Data Commons Collaborative (DCC), a secure, ethical, and innovation-ready platform to centralize access to AI-relevant datasets, synthetic data tools, and fairness-aware capabilities for researchers, startups, government, and academia across the Commonwealth. Our team is fully aligned with the vision and functional imperatives outlined in the DCC Requirements. The objective is clearly to build a scalable, user-centric, and governance-compliant solution that accelerates responsible AI development in the state of Massachusetts. Below are the detailed scope of work areas that our proposal aims to meet and exceed DCC's objectives -

1. Portal Development

- Launch a responsive, accessible public portal for discovering and accessing AI-ready datasets.
- Aggregate external, Massachusetts-specific, and synthetic datasets into a unified, searchable catalog.
- Enable filtering and faceted search by domain, data type, license, format, and source.
- Display dataset metadata, previews, and documentation through standardized cards and detail pages.
- Link to key external repositories (e.g., Hugging Face, NASA, MassGIS) with clear usage guidance.

2. Data Hosting & Management

- Host curated datasets with full version control, provenance tracking, and FAIR-compliant metadata.
- Provide programmatic access via APIs and in-browser previews for rapid exploration.
- Support role-based dataset permissions: Public, Restricted (approval required), Internal.
- Empower administrators with a dashboard to manage datasets, submissions, and link health.

3. Synthetic Data Capability

- Integrate synthetic data generation tools (e.g., SDV, Synthea, CARLA) for privacy-safe model training.
- Automate ingestion, profiling, de-identification, and configurable synthesis workflows.
- Tag and track synthetic datasets with full provenance, distinguishing them from real data.
- Provision scalable, containerized GPU/CPU environments for generative model execution.

4. AI Fairness & Bias Mitigation

- Embed bias detection and fairness evaluation tools (e.g., AIF360, Fairlearn) into the user workflow.
- Flag datasets and models exhibiting disparities across protected attributes.

- Offer mitigation techniques (pre-, in-, post-processing) with performance-fairness trade-off analysis.
- Generate automated fairness reports and dashboards with audit trails and drift monitoring.

5. Commons Credits System

- Implement a secure, auditable ledger to track credits for contributions, usage, and incentives.
- Reward users for uploading datasets, tools, or models — and for efficient, low-carbon compute use.
- Enable spending of credits to access premium data, train models, or unlock platform services.
- Equip admins with tools to set quotas, enforce policies, and generate usage analytics.

6. Security & Access Control

- Authenticate users via SSO and MFA, especially for sensitive or restricted resources.
- Enforce role-based access controls (RBAC) across user types (Researcher, Curator, Admin, etc.).
- Log all data access, downloads, and synthetic generation events for 3+ years.
- Protect data at rest and in transit with encryption, intrusion detection, and regular pen testing.

5 Proposed Approach to Providing Services

5.1 Vision for Change

Massachusetts has set out to create a unified Data Commons Collaborative (DCC) under the AI Hub, an initiative that can unlock the value of data for innovation, research, and public service. Today, data often sits in silos, scattered across agencies or locked away in formats that make it difficult to reuse. Researchers, startups, and civic innovators face barriers in discovering trusted datasets, generating synthetic data for testing, and ensuring that AI applications are ethical, fair, and secure.

The vision is clear to provide a centralized, secure, and equitable platform where data is not only stored but actively curated, enriched, and shared for the public good. By doing so, Massachusetts will accelerate AI development, strengthen economic competitiveness, and ensure that public sector use of AI remains transparent, ethical, and inclusive.

5.1.1 Inadev's Solution: Enabler of Transformation

Inadev proposes to design, build, and operationalize the Data Commons Collaborative as a trusted partner to the Commonwealth. We bring experience in delivering secure, large-scale data platforms and a deep understanding of AI/ML solutions. Our approach ensures that each functional requirement is directly met, while the outcome serves the broader mission of transparency, innovation, and public trust.

1. Accessible Website & Dataset Directory

We will deliver a public-facing website that highlights featured datasets, recent updates, and curated collections. Built on proven open-source frameworks such as CKAN (Should MassTech lean towards adopting Dataverse, we're fully equipped to support and move forward with that approach), the site will enable intuitive search and filtering by dataset type, source, domain, and license. Every page will be WCAG 2.1 compliant and optimized for performance with indexed search and caching, ensuring results load in under two seconds. Users will also be able to preview datasets directly before downloading, while community submissions flow through a moderation process managed via a dedicated admin dashboard.

Benefit: Instead of wasting time navigating multiple systems, users will have one trusted entry point for all AI-relevant datasets, promoting efficiency, accessibility, and inclusive access to state resources.

2. Hosted Data & Secure Access

The Data Commons will support both externally linked datasets and hosted data on a secure state-managed platform. Hosted datasets will be curated using automated ingestion pipelines that apply metadata standards at upload, ensuring consistency. Users will be able to browse, preview, download, or query data in multiple formats such as CSV, JSON, and Parquet, with built-in version control and lineage tracking to maintain transparency.

Benefit: Agencies and researchers gain confidence that they are working with accurate, up-to-date, and properly documented data, reducing duplication of effort and supporting compliance with FAIR data principles.

3. Commons Credits System

We will implement a secure, auditable ledger that tracks Commons Credits, allowing users to earn credits by contributing datasets or models, and to spend credits on premium datasets, training compute, or 3rd party applications. The system will also incentivize efficient resource use by granting additional credits for energy-efficient model training and reusable dataset contributions. All balances and histories will be available in a simple user dashboard, with transparent reporting to maintain public trust.

Benefit: This system fosters collaboration and fairness. Contributors are recognized and rewarded, ensuring that smaller agencies and research groups can participate equitably in the AI ecosystem.

4. Data Catalog & Metadata Management

Our platform will embed a robust cataloging system to manage descriptive, technical, and provenance metadata. Using standards like Dublin Core and DCAT, datasets will be searchable through full-text and faceted search. Role-based workflows will guide dataset publishing and approval, while collaboration features such as annotations and team-based curation will be supported. Dataset profiling tools will provide quick insights into data quality, structure, and completeness before use.

Benefit: Government agencies retain oversight and governance, while external stakeholders can still access and contribute within controlled boundaries. This balance protects data integrity and promotes interagency coordination.

5. Synthetic Data Generation

We will integrate leading open-source and commercial tools such as SDV, Synthea, and CARLA to generate synthetic datasets. These tools will cover structured, unstructured, time-series, and image data, configured to de-identify sensitive records while preserving statistical patterns. Agencies will be able to tune privacy versus fidelity trade-offs, and synthetic datasets will be stored with metadata linkages to their original sources. All pipelines will run on GPU/CPU infrastructure with containerized deployment to ensure scalability.

Benefit: Public health agencies can share realistic data without exposing patient records; transportation models can be trained on simulated but accurate data. This expands innovation opportunities while safeguarding compliance with HIPAA and state privacy laws.

6. AI Fairness & Bias Monitoring

Inadev will embed bias detection and fairness tools such as AIF360 and Fairlearn into the platform, coupled with dashboards that make audit results transparent. Every project using Commons data will follow ethical review workflows that require documenting potential bias impacts, with reports available to oversight committees. Integration with ML tools like Jupyter and MLFlow will enable seamless auditing during model development, while training modules and workshops will build staff capacity to apply fairness checks effectively.

Benefit: Agencies and the public can trust that AI systems built on this platform are equitable and transparent. This safeguards against unintended discrimination in high-impact areas such as healthcare, education, and transportation.

7. Governance & Compliance

We will implement a governance framework that aligns with state and federal requirements, including HIPAA, anti-discrimination laws, and AI regulations. A hybrid governance model will empower centralized oversight by a Data Use Committee while allowing individual agencies to approve and manage their contributions. The platform will also support multiple data-sharing models, such as federated, restricted, controlled, and open, so agencies can select the right approach for each dataset.

Benefit: Agencies will gain legal clarity and operational confidence, knowing that data-sharing agreements and ethical safeguards are embedded from the start.

8. Security & Access Controls

Our platform will enforce Single Sign-On (SSO) and Multi-Factor Authentication (MFA), with role-based access controls for Public Viewers, Researchers, Curators, and Administrators. Dataset tiering will be supported for public, restricted, and internal access. All data will be encrypted at rest and in transit, while full audit logs will be retained for at least three years. Continuous monitoring and intrusion detection systems will be in place, and regular penetration testing will be conducted to maintain a strong security posture.

Benefit: Security is not an afterthought; it is foundational. The Commonwealth can ensure that sensitive datasets are shielded from misuse while still enabling collaboration and transparency.

9. Ethical Guidelines Embedded in Practice

Transparency, accountability, and equity will not remain principles on paper. Every dataset will carry clear provenance documentation, usage tracking, and consent compliance. Automated checks will flag potentially biased or incomplete datasets, and oversight committees will receive regular reports on data use and governance practices.

Benefit: The public can see that the Commonwealth is setting the gold standard for ethical AI-protecting rights, building trust, and ensuring data serves the common good.

5.2 Technical Solution

5.2.1 Frontend Layer Overview

The Frontend architecture is a composable and modular system designed for data discoverability, user empowerment, and seamless collaboration.

a. User Access, Navigation & Security:

- Users from various roles (researchers, developers, administrators, auditors, policy analysts, and community contributors) access the platform via a globally distributed CloudFront and Route53 stack, protected by AWS WAF.
- AWS Cognito provides authentication, session management, and SSO integration for secure onboarding and access.
- Role-based navigation surfaces relevant screens and actions, ensuring responsive and secure user sessions.

b. Core User Interface & UX Modules:

- Home/Landing Page: Dynamic CMS integration, responsive layouts, accessibility support, and optimal caching deliver a snappy first impression.
- Dataset Directory & Detail: Fast paginated search, advanced filters, dataset scalability, lineage views, related dataset graphs, and versioning support enable rich data exploration.
- Submission & Review: Secure, validated forms for dataset and competition contributions, intuitive workflow states with real-time feedback, and easy file handling.
- Administrative Screens: Admin dashboards, CRUD for datasets and users, audit drilldowns, credits management, and compliance status are presented with real-time data and tile-driven layouts.

c. Tools & Visualisation Suite

- Analytical tools - text, image, video, tabular, and geospatial are embedded as modular screens with previews, markdown rendering, GPU support, overlays, and custom controls. Reports and analytics pages offer multi-source dashboards, real-time API and credit usage charts, interactive filters, and export. A seamless Jupyter session navigation, error management, and state preservation module is integrated.

d. Collaboration, Alerts, and Personalization

- Engagement and social learning are driven by a community with competitions, progress tracking, team formation, and leaderboard views. Personalised screens - user profiles, credits overviews, role-based access management, custom ranking, and achievement/badge progression - empower users and reinforce positive contribution. Alerts, notifications, transaction tracking, and audit logs ensure transparency, timely action, and compliance readiness.

e. Theming & Internationalisation

- The platform is white-label-ready, enabling consistent theming for different organisations. Internationalisation (i18n) is standard, allowing expansion to new languages and regions as the community grows.

5.2.2 Backend Layer Overview

The Backend consists of finely orchestrated, cloud-native services prioritising security, scalability, event-driven automation, and robust governance across data, AI, and user workflows.

a. Ingestion, ETL, and Dataset Provenance

- Automated batch ingestion pipelines using AWS Glue, Athena, and S3 offer retry logic, error handling, and performance optimisation.
- Record and dataset-level version control with rollback, diff, and metadata APIs ensures reproducibility and data stewardship.
- Glue Data Catalog integrates column-level lineage tracking, creating a single source of truth for dataset provenance.

b. Search, Discovery, and Secure Access Services

- The highly available Search API (ElasticSearch/OpenSearch) powers scalable queries even at large dataset volumes.
- The Discovery API provides federated querying across internal and external data via Athena and Lake Formation.
- The fine-grained Data Access API, fully RBAC-driven and integrated with Keycloak/AWS Cognito, enforces entitlements, supports session-aware data usage, and logs every data request for audits.

c. Governance, Audit, and Legal Compliance

- Separation-of-duty workflows and automatic hooks enforce dual control for policy changes and sensitive task approvals.
- All actions are written to a standardised audit trail schema, export-ready for regulatory review.
- Legal APIs manage consent, policy revocations, compliance tagging, and legal display enforcement, ensuring strict policy alignment.

d. Billing, Credits, and Event Workflow Orchestration

- Stripe-integrated credit and billing services with concurrency-safe APIs; credit issuance, spending, and refund flows are auditable and real-time.
- Comprehensive ledger, transaction APIs, credit entitlements, and usage-based billing controls ensure financial transparency.
- Notification Service (SNS/SQS/EventBridge) handles alerts, expiry, and usage thresholds.

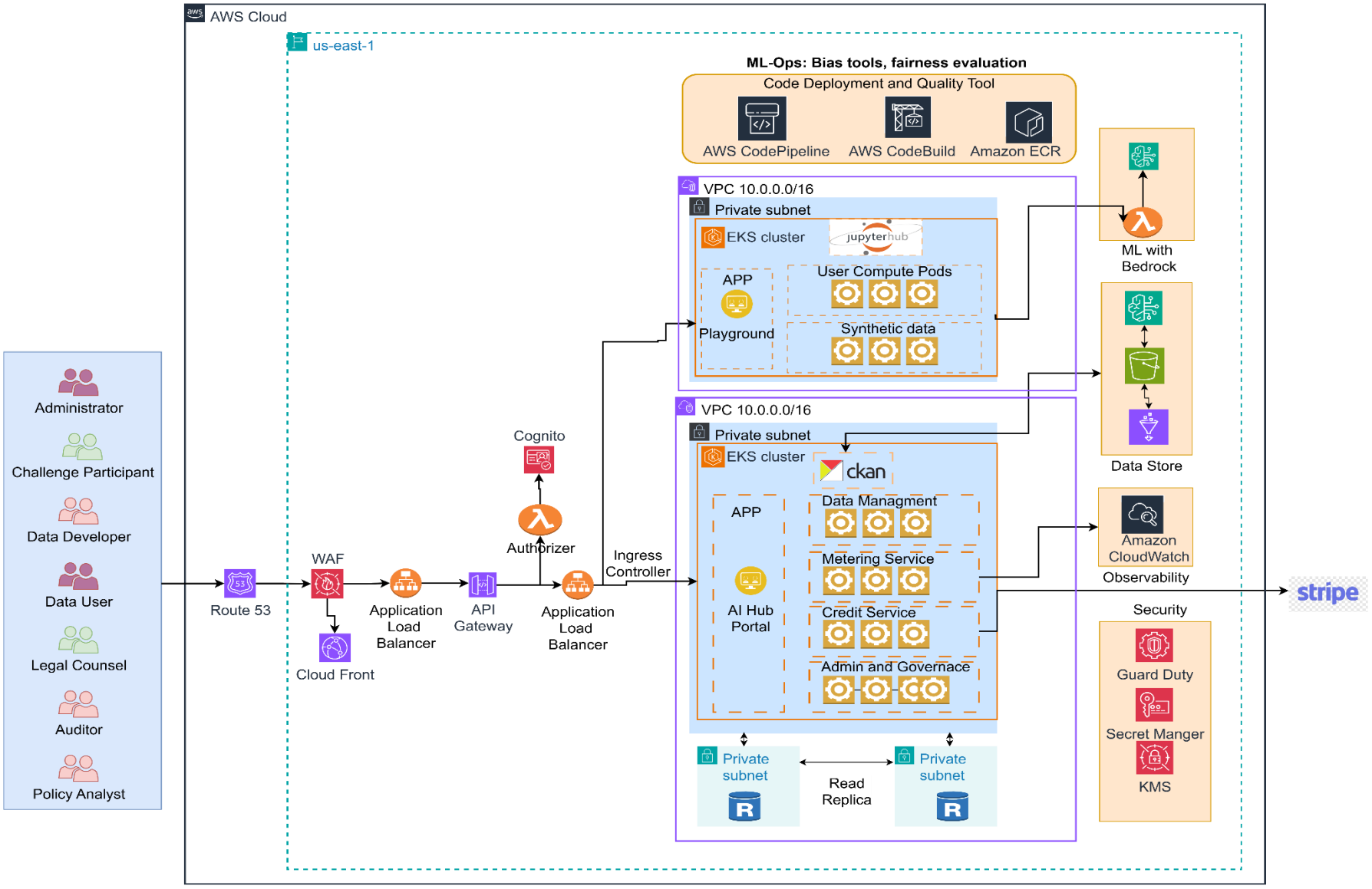
d. External integration, exchange, and security:

- Secure MassGIS/MGHPCC AICR connectors with VPN or PrivateLink for volume-based data exchanges, tokenised queries, and full authN/authZ management.
- All data in rest and transit uses KMS envelope encryption and strict TLS enforcement.
- Event-driven workflows via Step Functions and EventBridge orchestrate multi-stage pipeline automation with replay and audit support.

e. Competitions, sessions, and user/resource management:

- Competitions module for API-driven submissions, leaderboard updates, ranking, and progression engine management.
- Sessions API for GPU/CPU notebook lifecycle control, quotas, isolation, and automated billing hooks per user session.
- Robust user management with SSO, session refresh, RBAC, and compliance/tiered access.

5.3 Application Architecture



5.3.1 Architecture Overview

The architecture is designed as a layered system:

1. User Access & Security

- Users (Administrators, Challenge Participants, Data Developers, Policy Analysts, etc.) access the platform via Route53 → CloudFront → WAF.
- Amazon Cognito provides authentication and user management.
- A Lambda Authorizer enforces fine-grained access policies before forwarding requests to application load balancers.

2. Application Layer

- **EKS Cluster 1: Sandbox / Playground**
  - Hosts User Compute Pods (JupyterHub, synthetic data generators).
  - Isolated namespaces per user with resource quotas to prevent noisy-neighbor issues.
- **EKS Cluster 2: Core Platform**
  - Runs CKAN (dataset management), AI Hub Portal, Metering Service, Credit Service, and Governance modules.
  - Exposes APIs and dashboards for dataset discovery and credit management.

3. Data Management Layer

- Amazon S3 for raw and curated datasets (versioned, encrypted).
- Amazon RDS (Aurora) for relational metadata storage.
- Amazon ElastiCache (Redis) for session/state caching.
- Optional Lake Formation + Glue + Athena for structured dataset governance and query federation.

4. AI/ML Integration

- AWS Bedrock is integrated via a Model Gateway Service.
  - Handles rate limiting, prompt sanitization, logging, and cost metering.
  - Ensures AI workloads are billed back to user credits.

5. Deployment & MLOps

- CodePipeline, CodeBuild, and Amazon ECR manage CI/CD for platform microservices.
- ML models can be containerized and deployed as services within EKS or invoked through Bedrock.
- Bias detection and fairness evaluation tools can be added as part of the ML-Ops pipeline.

6. Observability & Logging

- Amazon CloudWatch for infrastructure and application logs.
- Prometheus & Grafana (inside EKS) for sandbox usage dashboards.
- AWS X-Ray/OpenTelemetry for request tracing.
- FluentBit → OpenSearch for centralized log search and audit trails.

7. Billing & Credit System

- Stripe integrated with the Metering Service.
- Credits can be purchased or earned and enforced at the sandbox/pod level.
- When credits expire, workloads are paused or terminated automatically.

8. Security & Compliance

- AWS GuardDuty for continuous threat monitoring.
- KMS & Secret Manager for secure credentials and dataset encryption.
- IAM Roles for Service Accounts (IRSA) to ensure least-privilege pod access to AWS resources.
- Network Policies and Service Mesh (Istio/Linkerd) enforce zero-trust communication inside EKS.

9. High Availability & Scalability

- All critical services (EKS clusters, RDS, Redis, ALBs) deployed across multiple availability zones.
- Auto-scaling for web tier, app tier, and user sandboxes.
- Aurora Serverless v2 provides elasticity for relational storage.
- S3 provides virtually unlimited, highly available dataset storage.

5.3.1.1 Benefits

- **Scalable and Cost-Effective**: Pay-per-use sandbox compute aligned with credits.
- **User Empowerment**: Secure playgrounds for dataset exploration without risking platform stability.
- **Enterprise-Grade Security**: Built-in IAM, GuardDuty, WAF, and encryption at rest/in transit.
- **Data Governance**: CKAN with dataset metadata, access control, and lineage tracking.
- **Future-Proof**: Extensible to support additional ML frameworks, external datasets, or marketplace integrations.

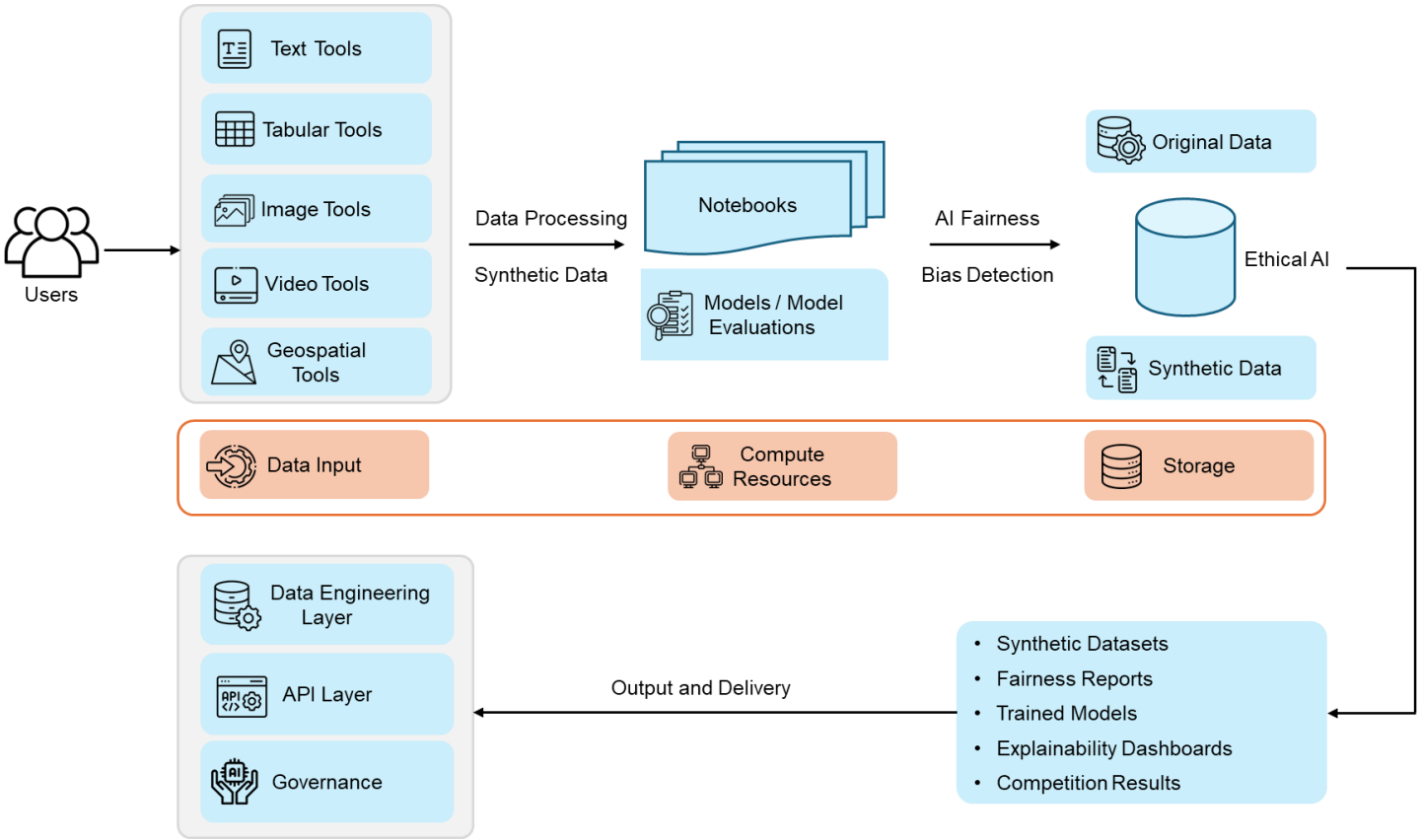
5.3.1.2 Future Enhancements

- Federated data access through Athena / Lake Formation.
- Integration with Kubecost for cost visibility of Kubernetes workloads.
- Expansion to a multi-region active-active setup for global resilience.
- Advanced AI model evaluation pipelines for fairness, explainability, and bias mitigation.

5.3.1.3 2. Key Features

- **Dataset Management**: CKAN-powered catalog with metadata, lineage, and governance.
- **Sandbox Environments**: User-specific compute pods (JupyterHub on EKS) to explore datasets securely.
- **AI/ML Integration**: Access to AWS Bedrock for foundation models, governed by a Model Gateway Service.
- **Credit & Billing System**: Stripe integration with metering service to enforce credit-based resource usage.
- **High Availability**: Multi-AZ deployment with auto-scaling at all tiers.
- **Security & Compliance**: GuardDuty, Secret Manager, KMS, IAM, and WAF for zero-trust and governance.
- **Observability**: Centralized monitoring (CloudWatch, Prometheus, Grafana, OpenSearch) for system and user workload visibility.

5.4 AI/ML Layer Logical Architecture



5.4.1 AI/ML Layer Overview

The Data Science (AIML) layer is a central pillar of the Massachusetts AI Hub Data Commons architecture, designed to empower researchers, data scientists, and developers with secure, scalable, and flexible environments for machine learning, data synthesis, and advanced statistical analysis. This layer facilitates reproducible research workflows and seamless collaboration through a blend of open-source tools and cloud-native services.

Key Components & Capabilities

1. JupyterHub-based Sandbox Environments

- Each user is provisioned with an isolated JupyterHub compute pod inside AWS EKS, supporting both CPU and GPU workloads as needed.
- Resource quotas and network policies restrict noisy-neighbour issues, ensuring predictable performance and security.
- Users can interactively explore datasets, run data preprocessing, feature engineering, and iterative model development within fully managed, scalable sandboxes.
- Notebook environments include rich Python libraries for data science, ML, AI, and visualization (e.g., pandas, scikit-learn, matplotlib, seaborn, TensorFlow, PyTorch).

2. Data Synthesis & Augmentation

- Integrated synthetic data generation frameworks (e.g., SDV, Synthea, CARLA) accessible via sandbox environments.
- Users can configure and generate privacy-preserving synthetic datasets to enable ML experimentation where real data is sensitive or scarce.
- Synthetic pipelines support multimodal synthesis - tabular, text, image, video, and time series - with clear audit trails linking synthetic and original datasets for provenance and compliance.

3. Open-Source Data Validation & Statistical Testing

- Inclusion of automated data validation tools leveraging open-source libraries for schema checks, missing values profiling, outlier detection, and distributional analysis.
- Statistical tests (e.g., t-tests, chi-squared, Kolmogorov–Smirnov) available as JupyterHub extensions or callable libraries, supporting robust data quality assurance.
- Integration with open-source frameworks (e.g., Great Expectations, Pandera) for reproducible validation of both real and synthetic datasets.

4. Visualization & Exploratory Analysis

- Interactive visualization APIs and libraries pre-installed (Plotly, Bokeh, Seaborn, Altair) for dataset profiling, model performance analysis, and insight discovery.
- Support for dashboarding tools inside sandboxes (e.g., Voila, Streamlit), enabling users to build and share domain-specific visualizations with stakeholders.

5. AIML Model Development & Availability

- Flexible environment to train and evaluate statistical models, traditional ML algorithms, and advanced deep learning architectures.
- Models can be containerized for deployment on the EKS platform or invoked through the Bedrock Model Gateway for LLM-based inference.
- ML-Ops pipeline integration (SageMaker, MLFlow) allows tracking experiments, managing model versions, and running bias/fairness audits at multiple stages.

6. Compute Resource Management

- On-demand scalable compute, supporting CPU-only or GPU-accelerated workload selection per sandbox/session.
- Metering by the custom Credit Service aligns compute usage (CPU/GPU time) to user credits, enforcing quotas and controlling costs.
- Option for users to bring their own compute environments for specialized tasks if approved.

7. AI Fairness, Explainability & Bias Mitigation

- Built-in libraries (AIF360, Fairlearn, SHAP, LIME) for fairness evaluation, bias mitigation, and result explainability.
- Notebooks and workflow tools allow subgroup analysis, exportable audit reports, and interactive "what-if" scenario testing.
- Continuous monitoring of deployed models for fairness drift and model performance.

8. Extensibility & Future-Readiness

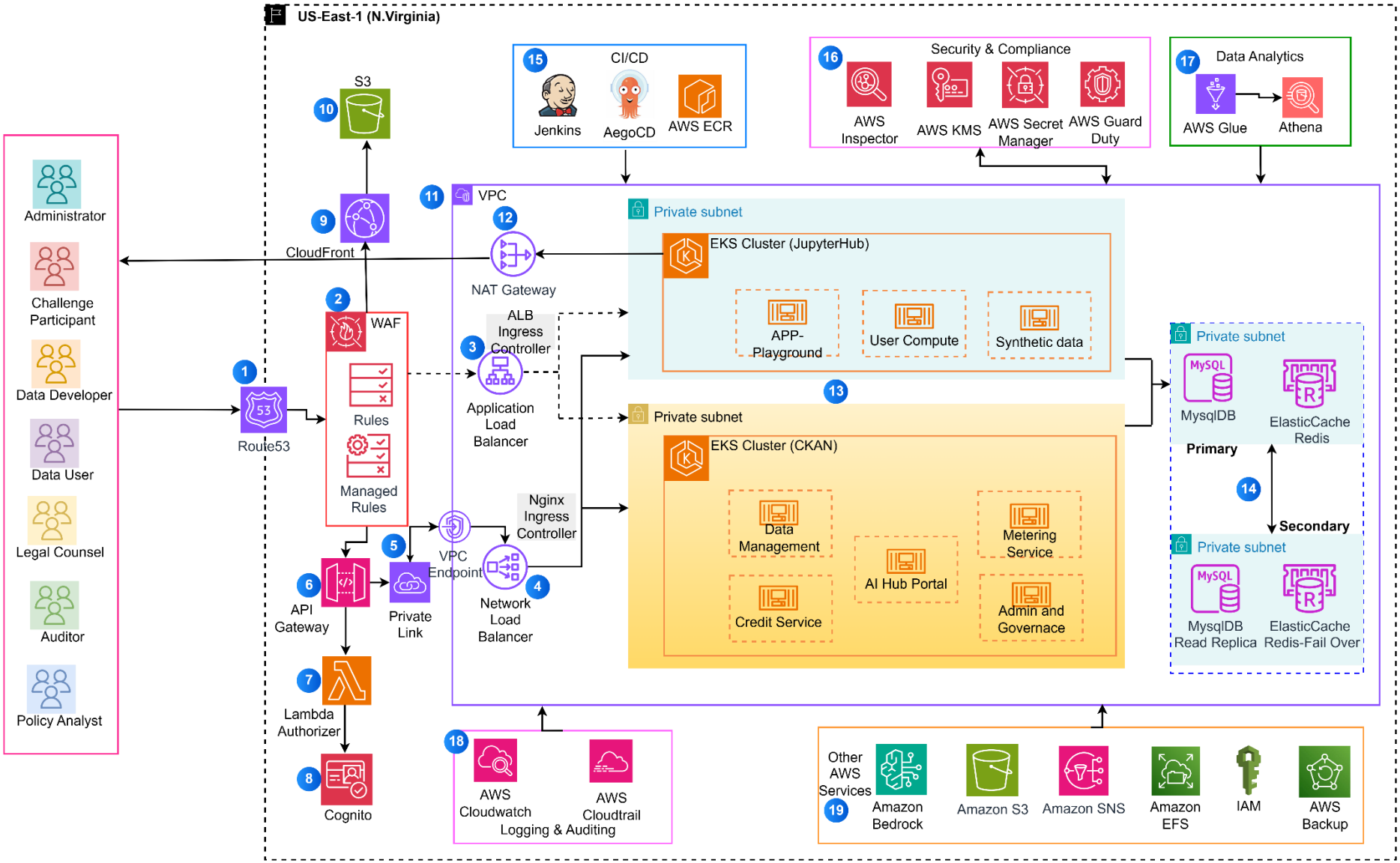
- Architecture supports onboarding new open-source libraries, integrating external datasets, and scaling advanced AI frameworks (e.g., transfer learning, federated learning).
- Future enhancements will allow active-active multi-region deployment, federated analytics, and marketplace integration for third-party models and datasets.

Benefits for Massachusetts AI/ML Community:

- Secure, scalable, and reproducible workspaces for every user type such as researcher, developer, data steward.
- Data privacy and security by design, with credit-based quotas controlling high-demand compute resources.
- Feature-rich AI/ML environment supporting the full lifecycle: from exploratory analysis to production-grade model deployment and ongoing fairness monitoring.

This layered approach ensures the Data Commons will remain future-proof, compliant, and aligned with the needs of enterprise, academic, and public sector innovators in Massachusetts.

5.5 Production Infrastructure Architecture



5.5.1 Production Infrastructure Architecture Overview

This architecture leverages a comprehensive suite of AWS services to deliver a secure, scalable, and highly available cloud environment. Below is a breakdown of the key components:

1. **Amazon Route 53**: Provides highly available and scalable DNS routing to direct user traffic efficiently.
2. **AWS WAF (Web Application Firewall)**: Protects applications from common web exploits and bots.
3. **Application Load Balancer (ALB)**: Distributes HTTP/HTTPS traffic across multiple targets for high availability.
4. **Network Load Balancer (NLB)**: Handles TCP traffic with ultra-low latency and high throughput.
5. **AWS PrivateLink**: Enables secure, private connectivity between VPCs and AWS services without exposing traffic to the public internet.
6. **Amazon API Gateway:** It is a fully managed service that allows you to create, publish, secure, and monitor APIs at scale. It acts as the front door for applications to access backend services such as AWS Lambda functions, applications running on Amazon ECS/EKS, or data stored in Amazon RDS and DynamoDB.
7. **AWS Lambda Authorizer:** It is a custom authorization function used with Amazon API Gateway to control access to APIs. It runs as a Lambda function and validates incoming requests before allowing them to reach backend services.
8. **AWS Cognito**: Manages user authentication, authorization, and user pools for secure access.
9. **Amazon CloudFront:** It securely delivers content (web pages, images, videos, APIs, and software downloads) to users with low latency and high transfer speeds. It uses a global network of edge locations to cache and serve content closer to end users.
10. **Amazon S3 (Simple Storage Service)**: Stores static assets, backups, and logs with high durability.
11. **Amazon VPC (Virtual Private Cloud)**: Isolates resources within a logically separated network for enhanced security.
12. **NAT Gateway (NGW)**: Enables outbound internet access for instances in private subnets while blocking inbound traffic.
13. **Amazon EKS (Elastic Kubernetes Service):** It is a fully managed Kubernetes service that makes it easy to deploy, manage, and scale containerized applications using Kubernetes on AWS. With EKS, organizations get the power of Kubernetes without the overhead of managing the control plane or cluster operations.
14. **Amazon RDS (Relational Database Service)**:

- Primary Tier: Handles main database operations.
- Secondary Tier: Provides failover and read replicas for high availability.

15 **CI/CD with AWS Code Services:**

- Jenkins will be used to build + CI automation (compiling, testing, packaging).
- Argo CD is best for CD + GitOps deployments (managing and syncing apps on Kubernetes).

16 **Security & Compliance in AWS:**

- **AWS Inspector**
  - An automated security assessment service.
  - Continuously scans EC2 instances, ECR container images, and Lambda functions for vulnerabilities or misconfigurations.
  - Provides prioritized findings based on severity, helping in proactive patching and compliance audits.
- **AWS KMS (Key Management Service)**
  - A fully managed encryption service for securing sensitive data.
  - Used to create and manage encryption keys that protect databases, application data, and backups.
- **AWS Secrets Manager**
  - Secure storage and rotation of secrets such as database passwords, API keys, and tokens.
  - Eliminates the need to hardcode credentials in applications.
  - Supports automatic rotation policies, improving security posture.
- **AWS GuardDuty**
  - A threat detection and monitoring service that uses machine learning, threat intelligence, and anomaly detection.
  - Identifies malicious activity such as unauthorized access attempts, data exfiltration, and compromised IAM credentials.
  - Provides actionable alerts for immediate remediation.

17 **Data Analytics:** Provides powerful, scalable, and cost-efficient analytics; we leverage AWS Glue and Amazon Athena. Together, they enable seamless ETL (Extract, Transform, Load), query processing, and insights without managing complex infrastructure.

- **AWS Glue**
  - A serverless data integration service used to prepare and transform data.
  - Automates ETL pipelines by discovering, cataloging, cleaning, and transforming raw data into usable formats.
  - Integrates with Amazon S3, RDS, Redshift, and other AWS services for centralized data management.
- **Amazon Athena**

- A serverless, interactive query service that analyzes data directly in Amazon S3 using standard SQL.
- No need for provisioning servers or data warehouses, pay only for the queries you run.
- Works seamlessly with Glue Data Catalog for schema and table definitions.

18 **Logging and Auditing:** To ensure full visibility, accountability, and compliance, we have implemented logging and auditing using Amazon CloudWatch and AWS CloudTrail. These services provide real-time monitoring, alerting, and governance across the infrastructure.

- **Amazon CloudWatch**
  - A monitoring and observability service for AWS resources and applications.
  - Collects logs, metrics, and events from EC2, Lambda, RDS, EKS, and custom applications.
  - Supports real-time dashboards, alarms, and automated actions (e.g., scaling or recovery).
- **AWS CloudTrail**
  - A governance, compliance, and auditing service that records all API activity across AWS accounts.
  - Captures details such as who made a request, from where, when, and what resources were affected.

19 **Other Services**: Along with core infrastructure, we utilize several AWS services to enhance AI capabilities, storage management, security, and backup/recovery.

- **Amazon Bedrock**
  - A fully managed AI/ML service for building and scaling Generative AI applications without managing infrastructure.
  - Provides access to foundation models (FMs) via an API, enabling tasks such as chatbots, text summarization, or personalization.
  - Scales securely and integrates with other AWS services.
- **Amazon S3 (Simple Storage Service)**
  - A scalable object storage service for storing application data, logs, and backups.
  - Offers high durability (99.999999999%) and lifecycle policies for cost optimization.
  - Integrated with AWS services like CloudFront, Athena, and Glue for analytics and delivery.
- **Amazon EFS (Elastic File System)**
  - A serverless, fully managed file storage service accessible by multiple EC2 instances or EKS pods simultaneously.
  - Automatically scales up/down based on demand.
  - Ideal for applications requiring shared storage.
- **AWS IAM (Identity and Access Management)**

- Provides secure access control across AWS services.
- Enables granular policies, role-based access, and integration with MFA (Multi-Factor Authentication).
- Ensures least-privilege access for compliance and security.

- **Amazon SNS**
  - Amazon SNS is a fully managed messaging service designed to enable decoupled communication between distributed systems, microservices, and serverless applications.
  - It allows you to send notifications or messages to multiple subscribers through various protocols.
- **AWS Backup**
  - A centralized backup service for automating and managing backups across AWS resources (RDS, EFS, DynamoDB, EC2, etc.).
  - Supports policy-based scheduling, retention, and compliance monitoring.
  - Ensures rapid recovery in case of failures or data loss.

5.5.1.1 Tech stack

Framework / Library	Purpose
React	Build the AI Hub Portal, dataset explorer, dashboards, and user interface
CloudFront + Route 53	Global content delivery and DNS-based routing for frontend
Node.js / Express	API services, business logic, credit enforcement, and billing integration
CKAN	Dataset management system (metadata, catalog, lineage)
JupyterHub on EKS	Sandbox compute environment for users to run experiments
Kubernetes (EKS)	Orchestration of sandbox pods, app services, auto-scaling, multi-tenancy
API Gateway + ALB	API exposure, traffic routing, load balancing
Amazon S3	Scalable storage for datasets (raw, curated, versioned)
Amazon RDS (Aurora)	Relational database for metadata, governance, user credits

Framework / Library	Purpose
Amazon ElastiCache (Redis)	In-memory caching for sessions, quota lookups, leaderboards
AWS Lake Formation + Glue + Athena	(Optional) Data lakehouse for governance, schema catalog, query federation
AWS Bedrock	Foundation model access for inference (LLMs, generative AI)
Custom Model Gateway Service	Prompt sanitization, logging, cost/rate control for Bedrock usage
ML-Ops Tools (SageMaker, Bias/Fairness evaluation)	Model deployment, explainability, bias checks
AWS Cognito	Authentication, SSO, user identity management
AWS WAF	Protection from web exploits and DDoS
AWS GuardDuty	Continuous threat detection and anomaly monitoring
AWS Secret Manager & KMS	Key management, dataset encryption, credential storage
Service Mesh (Istio)	Zero-trust networking, pod-to-pod communication security
Network Policies	Pod-level isolation and tenant sandbox separation
Amazon CloudWatch	Metrics, logs, alarms for AWS services
OpenTelemetry	Distributed tracing of API and sandbox calls
Prometheus + Grafana	Usage dashboards, credit consumption, resource monitoring
FluentBit + OpenSearch	Centralized log aggregation and searchable audit logs
AWS CodePipeline	Continuous delivery orchestration
AWS CodeBuild	Build automation for services and datasets ingestion pipelines
Amazon ECR	Container image repository
Helm	Kubernetes application deployment and versioning
Stripe API	Billing, payment processing, credit purchase
Custom Metering Service	Enforces runtime quotas, stops sandbox when credits expire
Kubecost	Kubernetes workload cost visibility and allocation

5.5.1.2 Assumptions

General

- The project duration stated in the timeline depends on MassTech's timely approval of deliverables.
- MassTech will provide all the required datasets.
- MassTech will provide all the artifacts for the website design text, images, videos, etc.
- A discovery phase will be conducted to meticulously outline the detailed requirements.
- MassTech will cover the third-party license costs for integrated services unless explicitly stated otherwise.
- Any activity not specified in the scope of the RFP will be regarded as part of change requests and will be billed additionally and separately.
- MassTech should ensure the availability of relevant business users and stakeholders to provide timely sign-off on requirements throughout the project's duration.
- Significant changes to the scope during the discovery phase may necessitate re-estimation of project efforts, leading to a revised schedule and pricing.
- MassTech is expected to provide timely sign-offs on requirements documents within the project's first two weeks. Delays resulting in idle time for dedicated resources may incur additional charges.
- The infrastructure cost is not included in the total cost and will be billed based on actual usage.

Technical

- **UI Screens:** Our estimate includes development of up to 40 distinct UI screens, aggregated from functional modules, with navigation, dashboard, admin, onboarding, and workflow screens clearly enumerated.
- **UI Sections & Features:** Each main screen/module will contain no more than the specified UI sections (up to 8 sections per feature-heavy screen), and a total of 10+ accessibility features and 2 dedicated i18n/language configurations.
- **APIs:** Up to 75 backend and integration APIs will be designed, implemented, or integrated across modules (calculating all listed APIs, including filter, scoring, metadata, lineage, download, compliance, reporting, ML/DS tracking, SSO, RBAC, and workflow endpoints).
- **Widgets & Components:** Visual/interactive widget counts are bounded – 24 card layouts, up to 15 analytics/visual widgets, 6 leaderboard/progression widgets, 5 charting libraries, 5 geospatial/data viz components, and 8 dashboard/report views will be developed.
- **Data & Analytics:** Deliverables will cover 3 catalog modules, 4 major data profiling/quality analytics, 5 competition modules, 2 FAQ/guides/search UIs, and 12 tool cards on tools home.

- **Processing & Validation:** Job scheduling, audit, forms, approval UIs are limited to 3 upload/progress modules, 3 workflow/audit log forms, 4 submission/approval forms, and support for multi-level workflow up to 4 levels.
- **Security & Compliance:** The solution includes 5 RBAC roles, 3 compliance reports/dashboards, 2 digital signature widgets, and up to 3 external identity provider integrations for SSO/MFA.
- **Data Sources & Integrations:** Integration scope covers up to 5 data connectors, One ML/DS Platform (e.g. JupyterHub), 3 file upload/job queue modules, and 2 export/report automation tools.
- **Multi-Tenancy & Extensibility**: Only the explicitly listed multi-tenancy, persistent state, and role-based access features will be delivered, with advanced/onboarding workflows strictly as itemized.
- **Miscellaneous:** Internationalization is supported for up to 2 languages; help/feedback includes 50 FAQ/help articles; no further UIs, endpoints, integrations, or roles are assumed in-scope unless detailed above.
- For additional screens, APIs, views, widgets, analytics, connectors, profiles, or configurations beyond these counts will be treated as additional work.
- For fundamental changes to listed numbers, new feature categories, or data flows will require a formal change order and may impact cost/timeline.

Risks Requiring Change Requests

- Any request to add UI screens, sections, APIs, dashboards, widgets, modules, analytics, data/report types, or tool integrations beyond the specific numbers and features enumerated in assumptions.
- Requests for support of additional user roles, RBAC permissions, multi-tenancy configurations, or security/compliance modules over what is listed.
- Expansion of internationalization/localization support to new languages or accessibility beyond three language configs and ten accessibility features.
- Integration with additional third-party systems, data connectors, new ML/DS runtimes, or external APIs not detailed in scope.
- Changes to workflow depth (levels/forms), upload/data processing steps, or job scheduling beyond the structured counts.
- Requests for more documentation, onboarding training, feedback/help content, or ongoing support than initially scoped.

Risks/Dependencies Impacting Timeline

- Delays in client approvals, provision of datasets, sign-offs on requirements, screen flows, or feedback during design and development phases.

- Dependency on client to supply subject matter experts for timely requirements clarification, validation, or content/data handover.
- Delayed access to necessary infrastructure, credentials, licenses, or compliance/legal decisions by client or related parties.
- Hidden quality issues in client-provided datasets or late discovery of data privacy/non-compliance problems that require remediation before go-live.
- Changes in external regulations, standards, or state-level security/compliance mandates outside the project team's control.
- Late decisions or resource constraints on the client side related to business users, pilot participants, or admin role nominations.

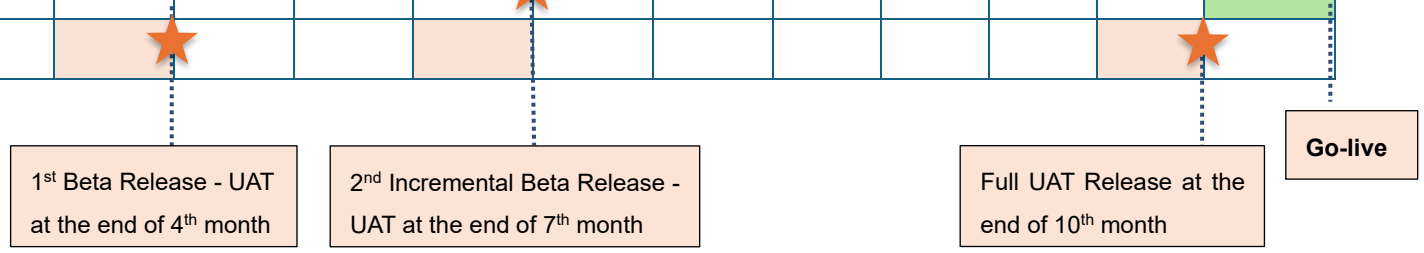
Support

- Ongoing support and maintenance activities are considered out of scope for this engagement. Any future support services, including post-implementation maintenance, enhancements, or operational assistance, will be defined and finalized separately based on mutual discussion and agreement between MassTech and Inadev at a later stage.

6 Implementation Timeline

* This timeline is indicative and is subject to change based on the discussions and priorities during the project.

Tasks	In Month													
	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10				M11
										W1	W2	W3	W4	
Discovery & Environment Set-up														
UX prototyping, Wireframing, and designing														
Development of DCC Portal														
Testing & UAT										UAT		Stabilizing Period		
Training, Hosting, and Go-Live														
Release Plan														

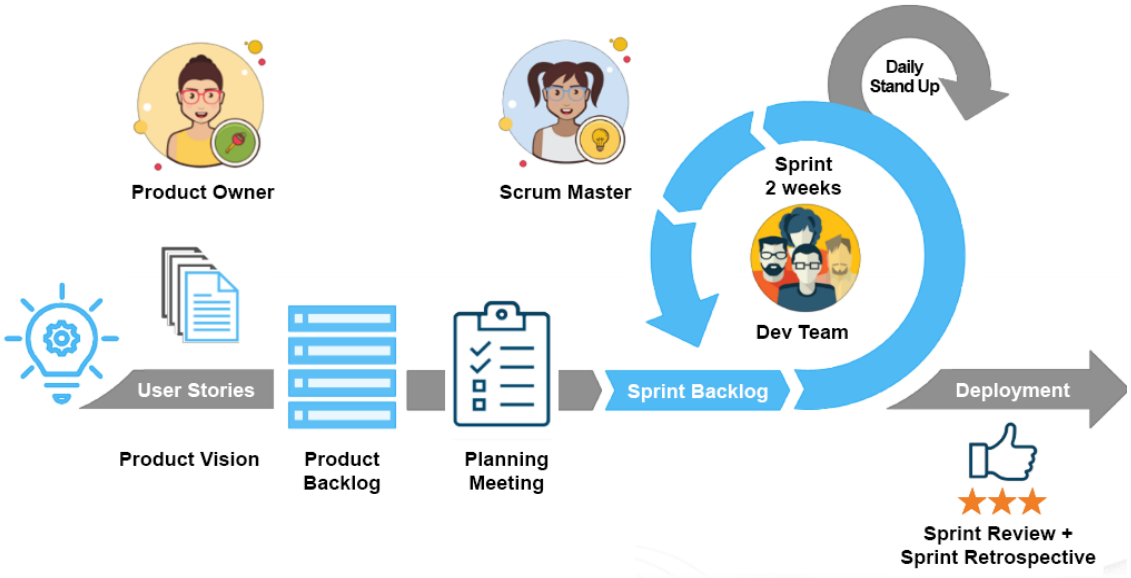

1st Beta Release - UAT at the end of 4th month
2nd Incremental Beta Release - UAT at the end of 7th month
Full UAT Release at the end of 10th month
Go-live

6.1 Deliverables and Milestones

- **Month 1: Discovery, Environment Setup**
    - Gather requirements through stakeholder interviews and collaborative workshops.
    - Set up the technical environment and perform initial configurations.
    - Provide a detailed project plan and timeline, and platform architecture documentation
- **Month 1-3: UX Prototyping, Wireframing, and Designing**
    - Develop wireframes and interactive prototypes for the Data Commons website
    - Design a modern, intuitive, and user-friendly interface aligned with MassTech's requirements and responsive across devices.
- **Month 2-9: DCC Portal Development**
    - Build Data Commons website with responsive UI components.
    - Create metadata catalog system (CKAN integration).
    - Develop Commons Credits ledger with transaction tracking and provide sample Commons Credits ledger output.
    - Implement role-based access control (RBAC) framework with MFA.
    - Integrate synthetic data tools (SDV/Synthea/CARLA) with validation pipelines and sample outputs.
    - Implement bias detection frameworks (AIF360/Fairlearn) with dashboards.
    - Develop data ingestion pipelines with provenance tracking and version control.
    - Implement security and governance.
    - Perform cross-browser and cross-device compatibility testing (desktop, tablet, mobile).
    - Perform accessibility (WCAG 2.1), performance, and security testing.
- **Month 3 - 10: Testing and UAT**
    - Conduct functional testing of all developed modules.
    - Conduct UAT, incorporate feedback, and refine the system.
- **Month 11: Staff Training, Hosting and Go-live**
    - Detailed walkthroughs of application workflows, module configuration, system maintenance, and troubleshooting.
    - Provide Training and Launch Materials
    - Full production deployment and live monitoring.

7 Project Management Methodology

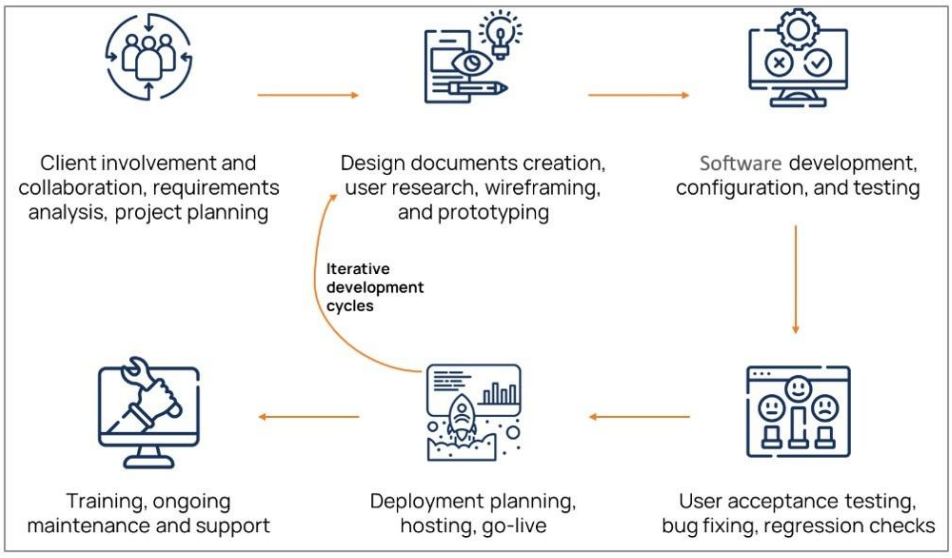
Following Scrum and Agile, we work with 2-week sprints each. These allow us to optimize the go-to-market time, showcase features and functionalities to stakeholders, and secure feedback for immediate updates to the solution. This creates a frictionless experience and enables us to keep the project on schedule and budget.



7.1 Implementation Approach Overview

Inadev's implementation approach relies on proven, repeatable Agile methodology, which provides the flexibility to incorporate changing needs, is user-centric and efficient and promotes the early and active involvement of all stakeholders throughout the project's lifecycle.

Some of the essential steps of our implementation approach are highlighted in the diagram below:


Client involvement and collaboration, requirements analysis, project planning
Design documents creation, user research, wireframing, and prototyping
Software development, configuration, and testing
Iterative development cycles
Training, ongoing maintenance and support
Deployment planning, hosting, go-live
User acceptance testing, bug fixing, regression checks

1. **Client Involvement and Collaboration**

- **Resource Mobilization:** We start the project by assigning the resources after the agreement is signed. The project manager and the business analyst are the first team members to be mobilized. They start the project preparation by setting up a Wiki and Jira accounts to facilitate project documentation.
- **Project Kick-off/Initiation:** We conduct project kick-off meetings with client stakeholders. We engage our PM and BA to understand their requirements in detail and capture relevant information. If required, we conduct interviews/meetings with the application's end-users to better understand their requirements, expectations, and challenges. At this point, we also brainstorm with the client and share our plans and recommendations regarding innovation and cutting-edge technology, including Artificial Intelligence and Machine Learning.
- **Inception Report – Review and Approval**: Based on the collected information, we prepare an inception report, which includes the scope of work, execution plan for the assignment, activity schedule, logistics plan, project communication plan, and stakeholders' involvement required for each activity. We generally use one-to-one meetings or group interactions to collect the required information during assessment and freeze the work scope.

2. **Technical Design Documents**

As Agile practitioners, our TDD creation process is iterative, involving continuous improvement and client collaboration at every development phase. We engage cross-functional teams to discuss the requirements, including developers, architects, product owners, and stakeholders.

- We begin with high-level architecture, creating rough sketches or diagrams to illustrate initial concepts. We use storyboards or flowcharts to visualize the user experience and system interactions.
- We break down user stories or features into smaller, more manageable tasks or sub-stories and develop design details incrementally, focusing on one user story or feature at a time.
- We conduct collaborative design sessions involving our UX and Development teams and client stakeholders.
- Subsequently, we develop the proper wireframes with style guides and branding guidelines before producing the final pages with content. We regularly review and iterate on designs based on feedback from team members, end users, and client stakeholders. We propose using Agile tracking tools like Jira to document feedback.
- We focus on lightweight documentation rather than exhaustive details and leverage visual aids like diagrams, flowcharts, or wireframes to supplement text-based descriptions.
- We gradually add more details to the TDD and enhance it as the sprint-based development progresses and new information emerges.

3. **Software system – Develop/Configure and Test**

- We use Agile and DevSecOps practices to develop the software within established quality gates and security standards. SAFe scrum-based software development, with its tenets of customer

satisfaction, iterative, continuous, and frequent delivery, technical excellence, and evolution and collaboration with the stakeholders, perfectly aligns with Inadev's automated DevSecOps delivery framework.

- In collaboration with client stakeholders, Inadev defines the development scope and populates the product backlog with epics, user stories, and corresponding acceptance criteria. This allows for the development of effective automated functional tests to ensure features are fully tested without technical debt or risks.
- To ensure high-quality delivery, Inadev integrates comprehensive testing with the development methodology, enabling our software development teams to provide enhanced UX, increase customer satisfaction, and reduce post-release issues. With minimal effort, we facilitate automating tests as part of the development process, allowing faster feedback on development and reducing the risk of regression bugs. This reduces the manual intervention in the deployment process and ensures that only reliable releases reach production.
- We use Vulnerability Assessment and Penetration Testing (VAPT) and Security Testing in the outlined Agile and DevSecOps framework to ensure that the developed applications adhere to stringent security standards and are resilient against potential threats. These processes are integrated into the software development lifecycle to proactively identify, mitigate, and validate security risks, aligning with quality, collaboration, and continuous delivery principles.
- We integrate sprint-based UAT into the development cycle to gather user feedback. UAT stakeholders interact with the application's implemented features to validate their functionality, usability, and alignment with requirements.
- Once feedback is received, development teams review it and discuss it with stakeholders. We then make necessary adjustments or improvements to the features during the sprint.
- We conduct regression checks to ensure that changes based on UAT feedback do not negatively impact existing functionalities. We further validate that user stories meet the defined acceptance criteria post-feedback incorporation.

4. Go-Live

- Based on the feedback received during UAT, we incorporate the necessary changes in the software solution.
- We plan the deployment process, including the schedule, deployment environments, and rollback procedures. We then collaborate with operations teams to ensure a seamless deployment process.
- Our incremental release approach includes deploying critical functionalities first and gradually adding others. We implement rolling updates to minimize downtime and disruptions during the go-live phase.

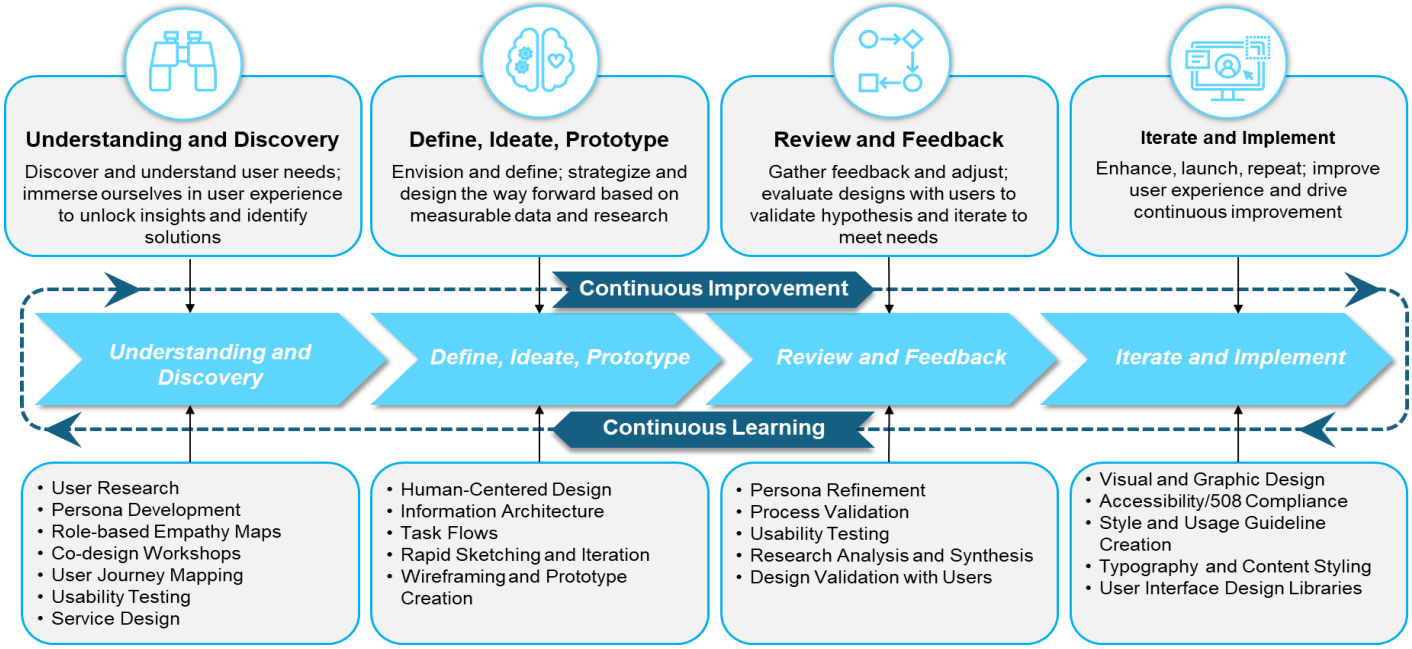
5. Training

- We provide training for designated application users so they can perform all the essential back-end functions.
- We will provide the following training and relevant assets:

- Software handling, configuration, maintenance, and troubleshooting
- Video tutorials
- Training materials
- User Guides; Troubleshooting Guides, User and Technical Manuals, Meeting Recordings.

7.1.1 Design Philosophy

The following outlines Inadev's proven Human Centered Design approach to designing digital experiences that streamline usability, allowing end users to focus on their core strengths.


Understanding and Discovery
Discover and understand user needs; immerse ourselves in user experience to unlock insights and identify solutions
Define, Ideate, Prototype
Envision and define; strategize and design the way forward based on measurable data and research
Review and Feedback
Gather feedback and adjust; evaluate designs with users to validate hypothesis and iterate to meet needs
Iterate and Implement
Enhance, launch, repeat; improve user experience and drive continuous improvement
Continuous Improvement
Understanding and Discovery
Define, Ideate, Prototype
Review and Feedback
Iterate and Implement
Continuous Learning
• User Research
• Persona Development
• Role-based Empathy Maps
• Co-design Workshops
• User Journey Mapping
• Usability Testing
• Service Design
• Human-Centered Design
• Information Architecture
• Task Flows
• Rapid Sketching and Iteration
• Wireframing and Prototype Creation
• Persona Refinement
• Process Validation
• Usability Testing
• Research Analysis and Synthesis
• Design Validation with Users
• Visual and Graphic Design
• Accessibility/508 Compliance
• Style and Usage Guideline Creation
• Typography and Content Styling
• User Interface Design Libraries

- **Research and Persona Refinement:** The initial phase focuses on understanding user needs and business objectives. This involves defining evaluation goals, updating user personas, and analyzing information and data from multiple sources, such as workflows and user journeys.
- **Testing and Analysis:** Inadev tests initial designs with user groups to gather feedback, iterate, and improve. Task scenarios, diverse participant understanding with stakeholder assistance, observation, and subsequent analysis of results help note areas for improvement. Alongside, heuristic evaluation assesses the design against established usability principles, identifying misalignments and prioritizing them.
- **Data-Driven Insights:** The analytics review stage comprehensively analyzes user interaction data through tools like Google Analytics and Microsoft Clarity. A review of conversion metrics complements this to detect drop-offs or areas needing enhancement.
- **Competitive Benchmarking, Compliance, and Stakeholder Input:** The evaluation process extends to benchmarking against competitors and industry standards. Input and feedback from various stakeholders help the team at Inadev ensure alignment with the application's broader business objectives.

- **Future Design and Continuous Improvement:** The final stages focus on future design planning to set clear design goals, prototyping, iterative design, and user research for new design concepts. Documentation captures findings and recommendations, fostering transparency through communication with the broader team. Continuous improvement is ingrained through a feedback loop with users and ongoing monitoring and optimization based on evolving needs.

This streamlined approach ensures a holistic evaluation process, covering diverse aspects of UX, from initial research to continuous refinement. All are aimed at delivering an optimal user experience within a usable application.

7.1.1.1 ADA/W3C Compliance

Our first step towards ADA and W3C compliance starts with determining the level of effort needed to become compliant. Activities include identifying the areas of change or improvement, plotting out a budget and timeline, determining the required deliverables, and developing an approach to expectations management. The scope of compliance is large, and we will achieve this sequentially targeting immediate and critical components at first.

Below are some common ADA/W3C issues and the resolutions taken up by Inadev:

- All images are accompanied by some alternative text associated with them in case those do not render on a device, or the user is unable to see the image. The alternative text helps clearly describe the elements shown in the image and enables readers to understand the information being presented.
- Important elements like buttons have more contrasted colors compared with the backgrounds to help users discern what the button is and where it should go.
- For easy understanding of all kinds of users, content is presented in different ways without losing information or structure. Using simpler layouts or interactive infographics are smart ways of presenting content differently yet effectively.
- Alternatives are provided for time-based media like audio and video. These could include pause/replay buttons or supporting text describing the media being played.
- Pages and sections of the website are clearly labelled for users to easily decipher where on the website they are.
- Areas of the website where user input is required are presented with ample instructions to efficiently guide the users.

7.1.2 Testing Approach

We leverage our home-grown, portable, and reusable test automation framework to streamline the software testing lifecycle. This framework drives efficiency, accuracy, and speed by reducing manual testing effort, accelerating release cycles, and improving overall system reliability across the portal.

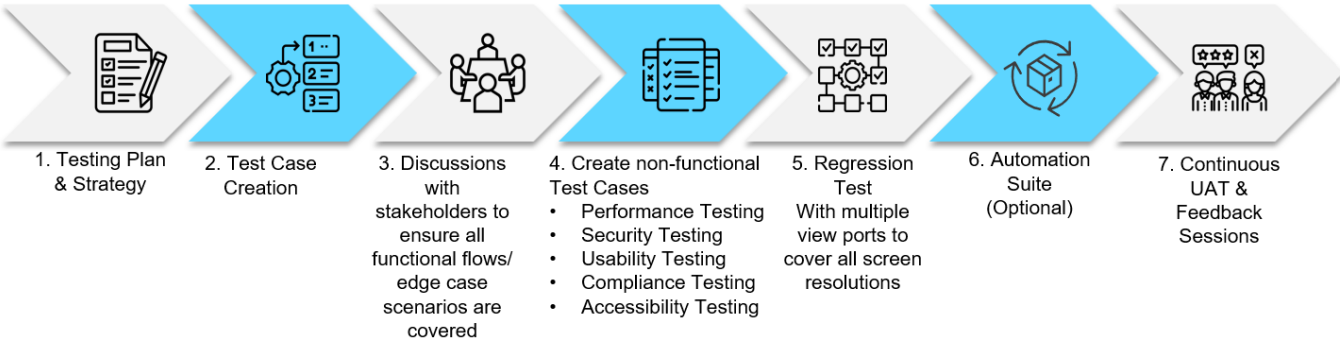
Our QA automation validation framework is seamlessly integrated with all our client applications. This framework leverages Selenium scripts to automate test execution and is a portable, reusable, and

integrated Test Automation platform for building more efficiency, accuracy, and speed into our testing processes.

We create a core regression suite consisting of all test cases. When changes are made to the application, the team analyzes the impact and updates the regression suite to evaluate it and identify test areas that need to be included.

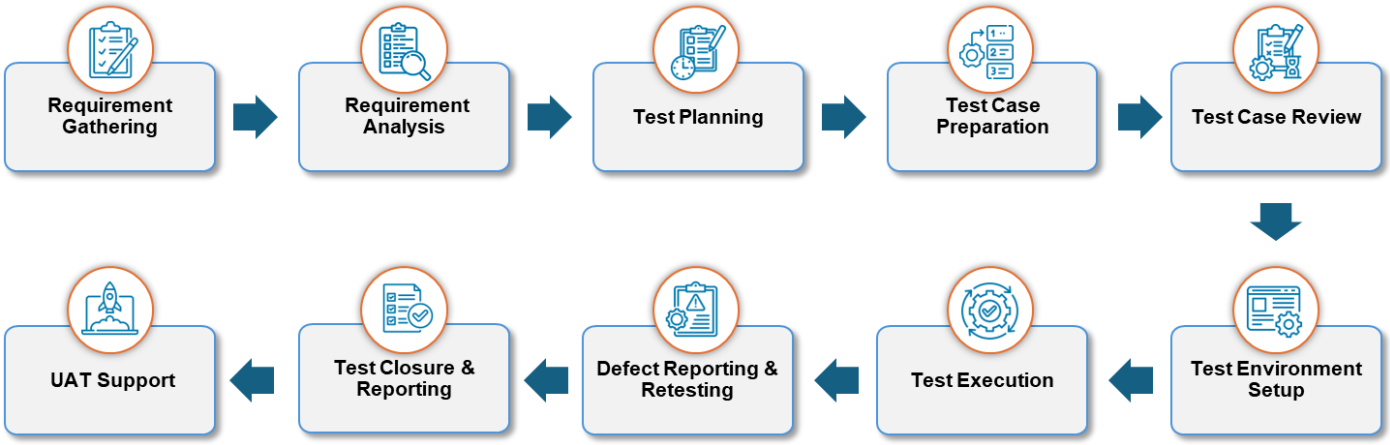
Our testers work as part of the implementation team and align with the quality goals specified by MassTech stakeholders. We perform non-functional testing tailored to requirements, including performance testing, security testing, usability testing, and scalability testing.

Our testing approach is highlighted below:


1. Testing Plan & Strategy
2. Test Case Creation
3. Discussions with stakeholders to ensure all functional flows/ edge case scenarios are covered
4. Create non-functional Test Cases
• Performance Testing
• Security Testing
• Usability Testing
• Compliance Testing
• Accessibility Testing
5. Regression Test With multiple view ports to cover all screen resolutions
6. Automation Suite (Optional)
7. Continuous UAT & Feedback Sessions

7.1.3 Our QA Process

Inadev's QA process ensures thorough validation and verification of deliverables through a structured approach. It begins with documenting detailed requirements to establish clarity and alignment with project objectives, followed by QA validation to identify gaps and risks early. A comprehensive test plan outlines the testing approach, scope, data strategy, environment setup, and risk mitigation measures. Baseline test cases are prepared to align with the requirements, and defect tracking is managed using tools like Jira for proper logging and resolution.



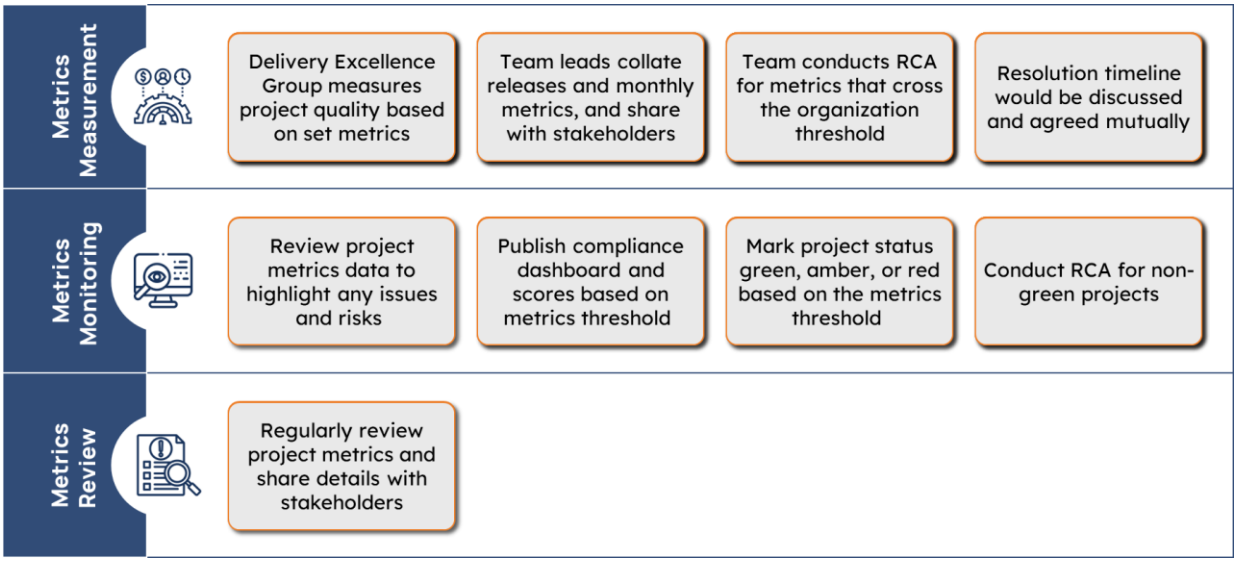
Various testing types, including sanity, functional, regression, usability, performance, and ad hoc testing, are executed using JMeter, Appium, and Selenium. Test results are meticulously documented in TestRail, while sprint validation ensures adherence to agile practices. Finally, the validated code is

transferred to the test environment for final verification, with continuous improvement integrated into the process to enhance future iterations. This robust process ensures high-quality outcomes for every project.

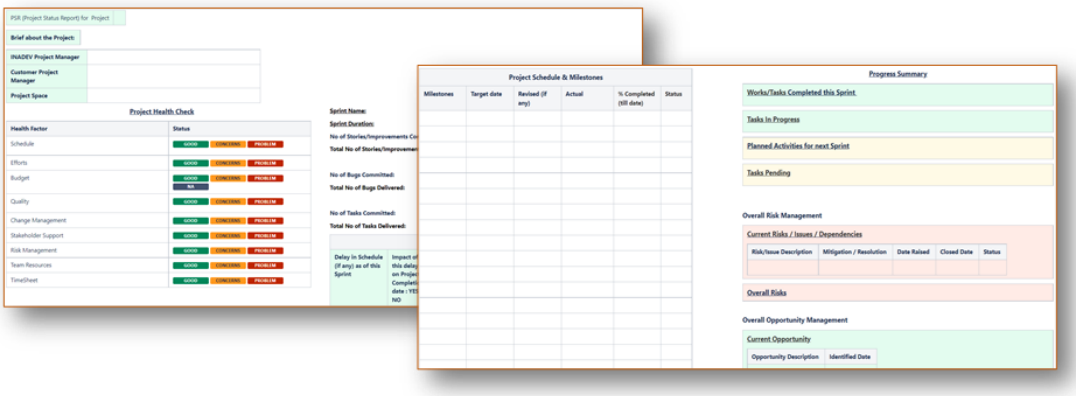
7.1.4 Process Improvement

Inadev's process improvement mechanism aims to enhance team efficiency, quality, and productivity. We employ a continuous cycle of activities involving every organization member. We adhere to industry's best practices and standards, including ISO 9001, ISO 20000-1, 27001, and CMMI L5 / DEV, for which we hold corporate certifications. These standards and certifications drive our quality assurance (QA) and quality control (QC) practices. We further implement industry-standard frameworks like ITIL, Agile, and DevOps to significantly optimize our processes, improve efficiency, and foster better collaboration.

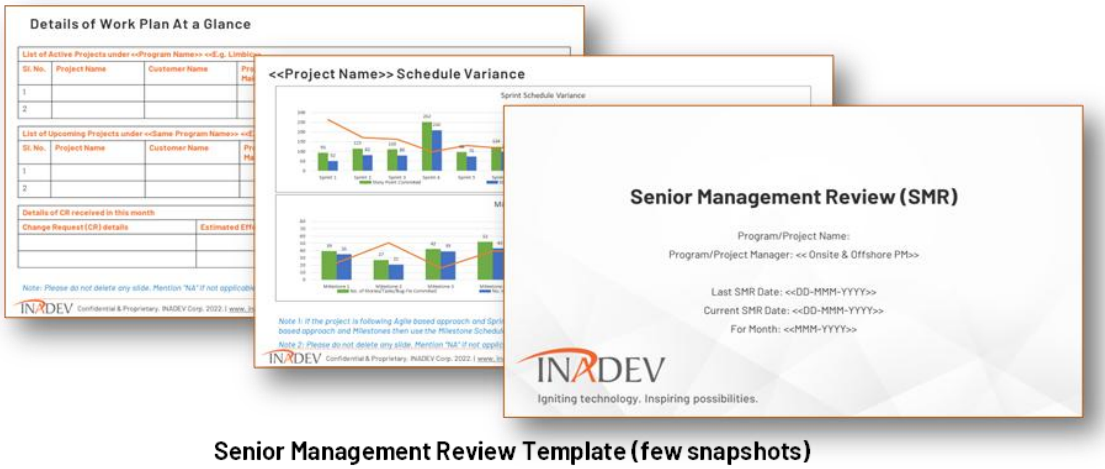
Quality Metrics and Reporting


Metrics Measurement
Delivery Excellence Group measures project quality based on set metrics
Team leads collate releases and monthly metrics, and share with stakeholders
Team conducts RCA for metrics that cross the organization threshold
Resolution timeline would be discussed and agreed mutually
Metrics Monitoring
Review project metrics data to highlight any issues and risks
Publish compliance dashboard and scores based on metrics threshold
Mark project status green, amber, or red based on the metrics threshold
Conduct RCA for non-green projects
Metrics Review
Regularly review project metrics and share details with stakeholders

Sample Reports



Project Status Reporting Template



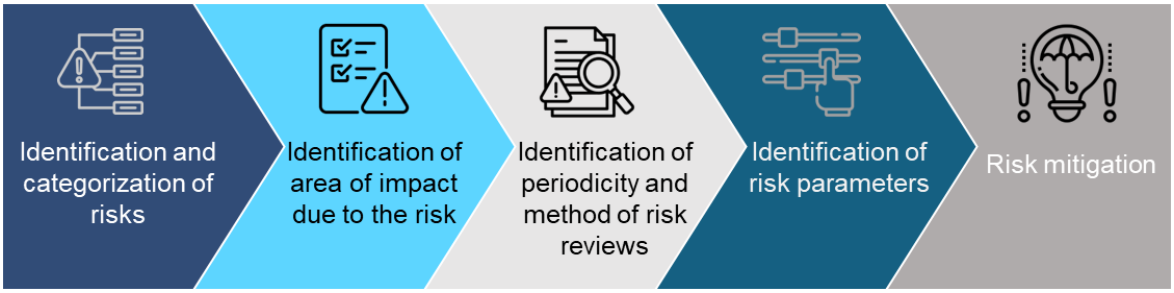
Senior Management Review Template (few snapshots)

Quality and operational excellence at Inadev evolved with industry trends and client requirements. Quality is not a static benchmark but a dynamic force that propels us ahead of the curve. Inadev's established system combines quality, service, and information security management with industry best practices to consistently deliver better products and services.

We regularly update and maintain the documentation to reflect changes in the software, address user feedback, and ensure alignment with evolving requirements. This helps improve communication between team members, reduce errors, and enhance software product quality.

7.1.5 Risk Mitigation Measures

Each project comes with its own risks and challenges, and often, these risks are unique to each project. We customize our approach accordingly. Our Risk Management approach ensures that each risk identified within the project environment is documented, escalated, and mitigated appropriately. Our risk management plan involves establishing a risk strategy through:


Identification and categorization of risks
Identification of area of impact due to the risk
Identification of periodicity and method of risk reviews
Identification of risk parameters
Risk mitigation

We determine the action plan using the risk score as per the criteria mentioned in the following table:

Risk Priority	Risk Score	Mitigation		Contingency	
		Identify	Implement	Identify	Implement
Low	0.2 – 3.0	Y	N	Y	N
Medium	3.1 – 5.0	Y	Y	Y	N
High	5.1 – 9.0	Y	Y	Y	N
	Risk Occurrence	Y	N	Y	Y

7.1.6 Communication

Inadev will assign an experienced Project Manager (PM) to oversee the project, ensuring contract accountability and performance. The PM will lead weekly status meetings, provide progress reports, and address challenges. The PM will be instrumental in ensuring the project stays on task and adequately addresses any potential challenges. Our communication process is flexible and follows the modes of communication mentioned below:

Direct face to face interaction when required
Daily / weekly status updates
Chat Engines (TEAMS, Slack, Zoom, Meet, etc.) for instant communication

7.2 Maintenance & Support

While support and maintenance are currently out of scope, this section demonstrates Inadev's capability and readiness to meet defined SLAs in similar large-scale engagements. Our typical app support involves end-to-end resolution of reported incidents, fixing performance issues, system outages, patch upgrades, bug fixes, vulnerability management, troubleshooting with root cause analysis (RCA), knowledge hub management, and maintaining guides and documentation.

Typical infra support is around incident resolution, fixing network issues, logging, health & performance of network devices, servers, storage, and other infrastructure components. It also involves disaster recovery, security compliance, business continuity against hardware failures, patch upgrades, rollbacks, and implementing and maintaining security controls and measures to protect the infrastructure from cyber threats, unauthorized access, and data breaches.

Usually, our support window for application support is 5 days a week (Monday-Friday), excluding US holidays, hours: 8 hours (9 AM - 5 PM local time), and infrastructure Support is 24x7. Our SLA adherence has been 99.99% for incidents of all priorities. For MassTech, we will evaluate support window and support coverage, along with effort estimates, in later stages, owing to mutual agreement.

7.2.1 Service Level Agreements (SLAs)

Application Support

Issue Severity	Issue Report Acknowledgement	Remarks
Priority 1	30 minutes	Severity 1 (e.g., system unavailability)
Priority 2	45 minutes	Severity 2 (e.g., does not affect service level commitment)
Priority 3	1 hour	Severity 3 (e.g., latency or minor bugs)

Infrastructure Support

The following are the issue severity-based metrics

Issue Severity	Issue Report Acknowledgement	Resolution SLA	SLA Adherence Expectation
Critical – A severe issue renders the IT system completely unavailable, impacting all users.	30 minutes	4 hours	99.99%
High – There is a major issue with the IT system's major functionality, and some specific departments/groups of users are impacted.	45 minutes	8 hours	99.99%
Medium – Defect on the non-critical module or feature of the IT System, and a single user is impacted.	1 hour	16 hours	99.99%
Low – Cosmetic or appearance-related issues that do not impact the functionality of the application or affect the IT system	2 hours	24 hours	99.99%

7.2.1.1 Support Metrics

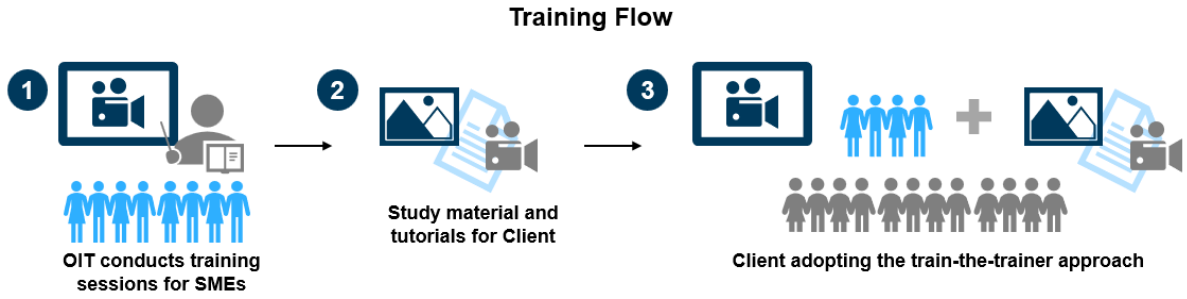
In similar engagements, the following are the Support Metrics that are measured and reported on a weekly, monthly, and quarterly basis (can be customized as per the customer's needs):

- **Issue Aging for a selected period** (# of Issues Unresolved | Total Age | Average Age)
- **Resolution Time Report for a selected period** (# of Issues Resolved | Total Resolution Time | Average Resolution Time)
- **Created vs. Resolved Issues** Report for a selected period (# of Issues Created | # of Issues Resolved)
- **Incident Ticket Reports in a month (**# of Total Incident Tickets | Average Resolution Time | Total # of Tickets Closed, etc.)
- **IT Infra Monitoring Alert in a month** (Total # of Alert Received | Type of Alert Received | Corrective or Preventive Action taken etc.

As, ongoing support and maintenance activities are considered out of scope for this engagement. Any future support services, including post-implementation maintenance, enhancements, or operational assistance, will be defined and finalized separately based on mutual discussion and agreement between MassTech and Inadev at later stages.

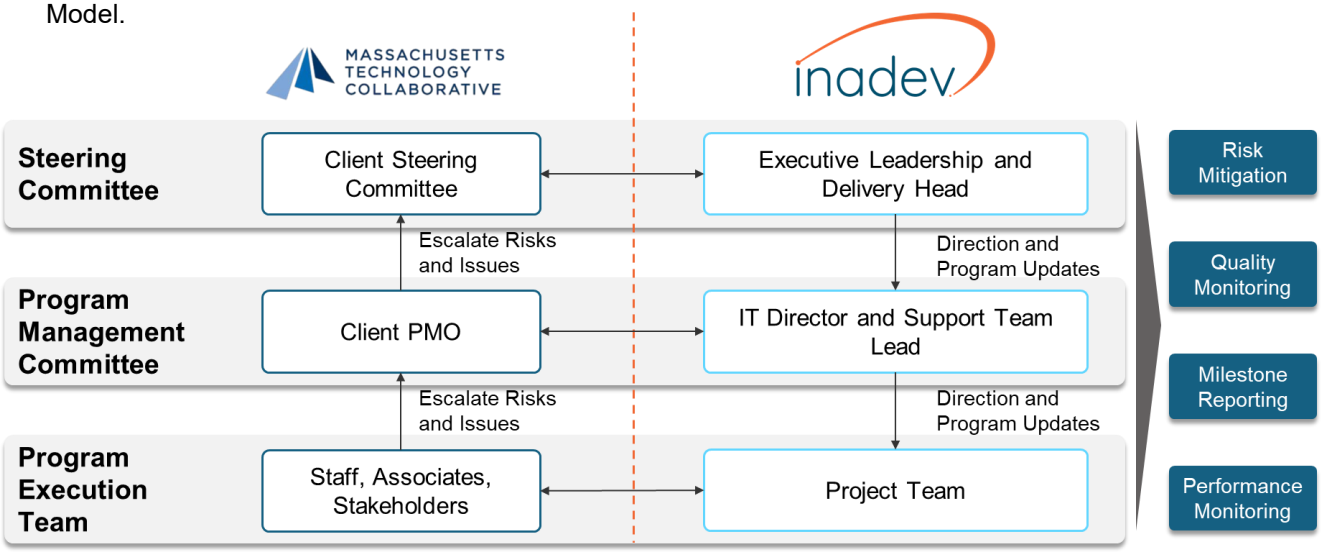
7.2.2 Training Approach

- We will adopt a train-the-trainer approach, where MassTech will identify SMEs/staff/admin users for the first round of training
- We will train the nominated users from MassTech in 2-3 training sessions
- We will provide the following kinds of training:
    - Online training: Application handling, configuration, maintenance and troubleshooting.
    - Video tutorials.
    - Training materials: User Guides, Troubleshooting Guides, and Other Technical Manuals.
- MassTech will need to implement an organization-wide change management approach, wherein the initially trained SMEs/experts/admin users will train all future admin users as and when required.



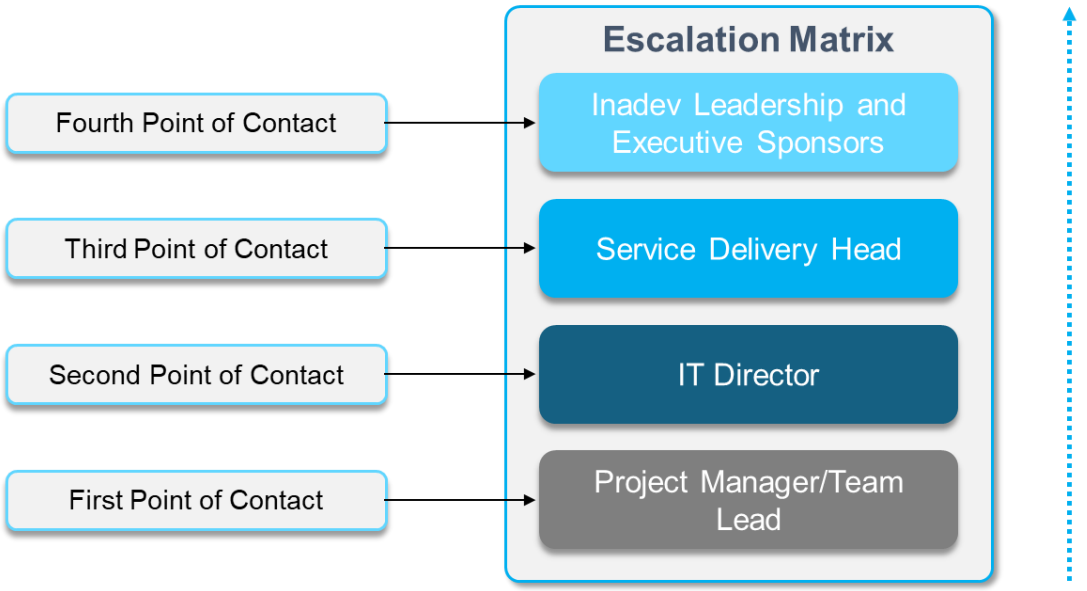
7.2.3 Project Governance Model

Inadev has established a project governance structure to oversee and manage the various engagements catering to MassTech project requirements. Within this framework, SMEs play a crucial role in defining the methods and procedures necessary for decision-making, communication, and progress monitoring throughout the project. The diagram below illustrates Inadev's Project Governance Model.



7.2.4 Escalation Matrix

The diagram below illustrates Inadev's project Escalation Matrix.



Inadev's escalation matrix consists of 4 levels:

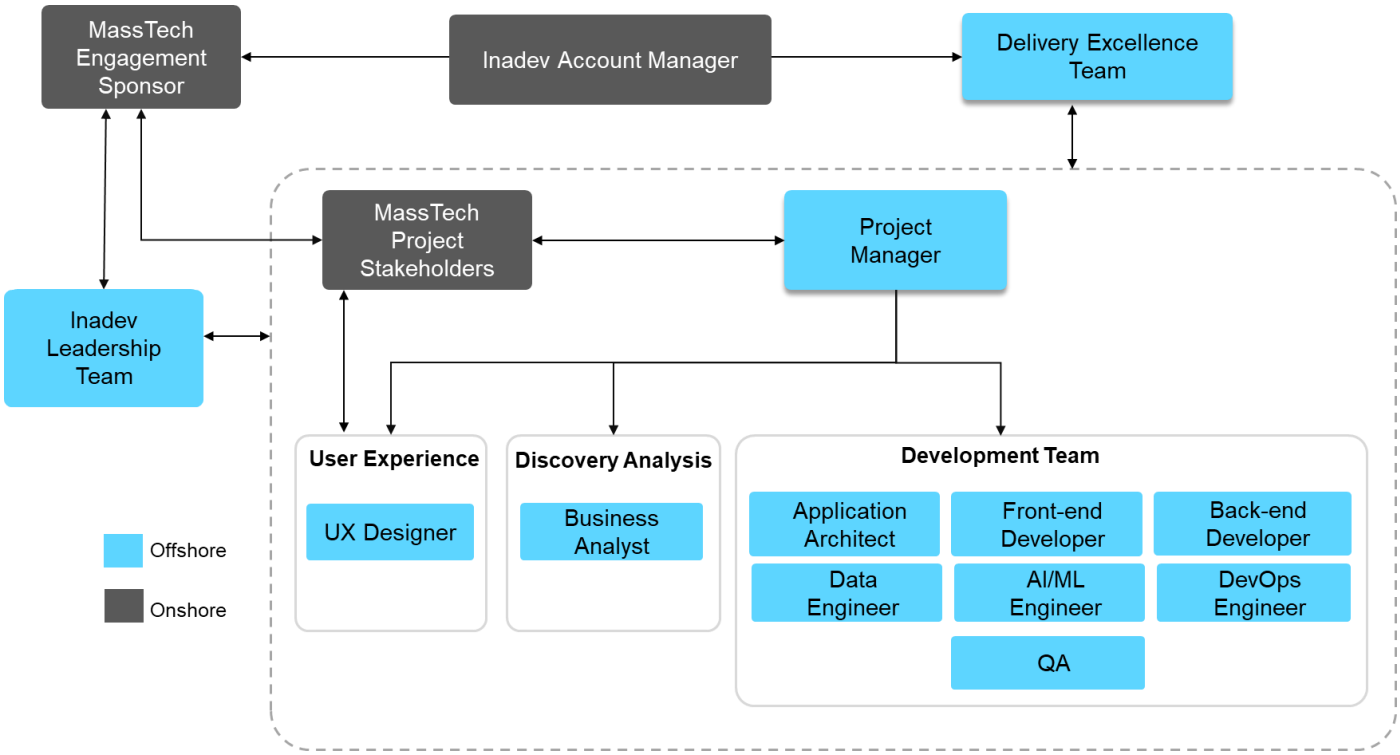
- When there is any issue, the first point of contact will be the Project Manager or the Team Lead, who will work to resolve it as soon as possible.
- If the Project Manager finds it challenging to address the issue, the PM or MassTech team can contact our IT Director, who will have the oversight and authority necessary to take appropriate action to resolve the issue.
- The third point of contact in the Escalation Matrix will be Inadev Service Delivery Head.
- The fourth level of the escalation matrix will be the Inadev Leadership and Executive Sponsors.

In most cases, the Inadev Service Delivery Head and the IT Director can address any escalated issues or risks at their levels. However, when an issue needs to be escalated further, the Inadev Leadership and Executive Sponsor will be proactively aware of it. They will help address major problems to achieve the outcomes of the project and keep the program on track to meet its critical milestones.

8 Project Team Structure

Inadev's team for MassTech will consist of a highly skilled group of professionals with extensive experience in software development and project management. This diverse team brings together expertise and innovative perspectives to deliver a customized solution tailored to MassTech requirements.

Inadev will leverage an onshore-offshore model for cost efficiency and quality service. Our India-based team operates around the clock, with a project manager ensuring smooth communication and regular updates with MassTech stakeholders. The Account Manager will be the main point of contact between Inadev and MassTech, managing stakeholder relationships, addressing concerns, and ensuring seamless communication throughout the project. The diagram below illustrates the organizational structure of our proposed team. It outlines how they will engage with MassTech stakeholders to ensure seamless communication, efficient project execution, and successful delivery.



- The Inadev leadership will play a key role in decision-making and will collaborate with the MassTech team as necessary.
- The Account Manager will serve as the primary liaison between MassTech and the Massachusetts AI Hub stakeholders, ensuring strategic alignment and managing contract compliance throughout the engagement.
- The Project Manager will develop and maintain the integrated project plan and timeline, conduct regular stakeholder meetings, and ensure all DCC milestones are met on schedule.

- The Business Analyst will coordinate with stakeholders to gather requirements, document FAIR data principles, and establish workflows for dataset curation and bias impact documentation.
- The Frontend Developer will create responsive user interfaces for the data commons website, implement metadata discovery tools, and develop visualization dashboards for bias reporting and usage analytics.
- The Backend Developer will design and implement server-side logic for data access APIs, develop ingestion pipelines with version control and provenance tagging, and build the central ledger for tracking Commons Credits.
- The Application Architect will design the end-to-end system architecture for the Data Commons Collaborative, define technology standards and patterns, ensure scalability and performance requirements are met, and provide technical guidance to development teams throughout implementation.
- The Data Engineer will build and optimize data ingestion pipelines, implement ETL processes for dataset integration, ensure data quality and integrity across the platform, and develop infrastructure to support metadata management and provenance tracking.
- The AI/ML Engineer will integrate synthetic data tools (SDV, Synthea, CARLA), implement bias detection and mitigation frameworks (AIF360, Fairlearn), and develop validation pipelines for synthetic dataset generation.
- The UX Designer will conduct user research with researchers and government stakeholders, create wireframes for metadata catalog interfaces, and prototype workflows for synthetic data generation and bias auditing.
- The DevOps Engineer will manage cloud infrastructure setup and optimization, implement CI/CD pipelines for automated deployment, and configure security controls including RBAC, MFA, and audit trails.
- The QA Engineer will execute comprehensive testing across all platform functions, validate FAIR data compliance, verify bias detection accuracy, and ensure security requirements are met before public launch.
- The Delivery Excellence team will support the project team to ensure delivery of the best value, aligning with MassTech's goals and objectives.

9 Resumes of Key Personnel (Indicative)

9.1.1.1 Account Manager

Neha Sharma
Background and Relevant Experience: Neha is a results-driven Account Manager and product management professional with 12+ years of experience successfully leading complex projects for non-profit, federal, and private enterprise clients. She brings expertise in defining product roadmaps, analyzing business requirements, and ensuring exceptional user experience. Deepali excels in leading multidisciplinary design-development teams, collaborating cross-functionally to align product design with business goals and user needs. With her expertise in non-profit and enterprise-level digital initiatives, Neha is well-positioned to support the project's mission by driving technology-enabled solutions that improve service delivery, operational efficiency, and community engagement. **Key Expertise and Achievements:** • Proficient in managing diverse non-profit, federal, and private enterprise IT projects, ensuring successful delivery of programs within scope, schedule, and budget. Skilled in program administration, stakeholder engagement, and risk and change management. • Expertise in driving end-to-end digital transformation initiatives, including modernizing legacy systems, implementing cloud migration strategies, and enhancing applications with emerging technologies. • Experienced in managing cross-functional teams, including Business Analysts, DevSecOps engineers, UI/UX designers, and Solutions Architects, to deliver high-quality outputs using Agile methodologies. • Worked closely with non-profit executives, federal officials, and corporate leaders to align technology solutions with business objectives, ensuring smooth execution and adoption of digital initiatives. • Managed multiple Agile teams to ensure on-time delivery of high-quality IT solutions, fostering collaboration and aligning efforts with project objectives.
Past Experience • Design and Development of Youth Engagement Mobile Application (Generation Unified) for Special Olympics Unified Champion Schools. • Business Centre-Portal Development and Permits Wizard Portal Development for District of Columbia. • Tracking Counterfeit Networks for Consortium of the World's Largest E-Commerce Retailers. • Development of a Nationwide Biometric Collection System for the Census Bureau. • Development and Maintenance of the Stateside web application.
Education and Certifications • PSM-I, Scrum Master Certified, Basics of Supply Chain Management (BSCM) from APICS. • M.B.A. from Symbiosis Center for Information Technology, Pune, India • Bachelor of Computer Application from GGSIP University, India

9.1.1.2 Project Manager/Business Analyst

Soumen Dey

Background and Relevant Experience:

Soumen is an accomplished Project and Product Management professional with 9+ years of experience delivering complex initiatives for state and federal clients. He has a strong track record of leading cross-functional teams to achieve project goals within scope, schedule, and budget, while maintaining the highest quality standards. His expertise spans risk management, stakeholder communication, and resource optimization, enabling him to consistently drive projects to successful completion. Known for his ability to engage stakeholders at all levels, Soumen fosters transparency, collaboration, and alignment with organizational objectives.

Key Expertise and Achievements:

- Skilled in developing project plans, managing timelines, milestones, and deliverables, while leading teams to meet client requirements.
- Experienced in identifying risks, implementing mitigation strategies, and managing scope changes without compromising project success.
- Strong knowledge of software development and testing lifecycles, with expertise in documentation, application design, integration, testing, and troubleshooting.
- Experienced in managing cross-functional teams, including Business Analysts, DevSecOps engineers, UI/UX designers, and Solutions Architects, to deliver high-quality outputs using Agile methodologies.
- Worked closely with federal officials, and state agency to align technology solutions with business objectives, ensuring smooth execution and adoption of digital initiatives.
- Effective communicator with internal teams, clients, and executives, providing regular project updates, retrospectives, and lessons learned.
- Managed multiple Agile teams to ensure on-time delivery of high-quality IT solutions, fostering collaboration and aligning efforts with project objectives.

Past Experience

- Development and Maintenance of “DC One City Business Portal” for the District of Columbia Regulatory Authority (DCRA).
- Tested and supported a Thailand-based Real Estate Portal.

Education and Certifications

- MBA in IT Business Management from Symbiosis Centre for Information Technology, Pune, India.
- B. Tech in Computer Science from Uttar Pradesh Technical University, India.

9.1.1.3 Front-end Developer

Aman Kapoor

Background and Relevant Experience

Aman is a highly skilled Front-end developer with 6+ years of experience building user-friendly, visually appealing, and accessible web and mobile interfaces. He specializes in React.js and its ecosystem, creating responsive and performant applications across diverse platforms. His expertise includes React hooks, Redux, Context API, and integration with RESTful and GraphQL APIs to deliver dynamic, interactive experiences. Aman has contributed to digital transformation initiatives for non-profit, federal, and enterprise clients, combining intuitive design with robust technical execution.

Key Expertise and Achievements

- Translating design files (e.g., Figma, Sketch, PSD) into functional, responsive web pages using React.js, HTML5, CSS3, and JavaScript/TypeScript.
- Building scalable, reusable UI components and managing state with Redux, Context API for efficient data flow.
- Implementing responsive designs to ensure seamless user experiences across devices and screen sizes.
- Integrating frontend interfaces with RESTful APIs or GraphQL for dynamic content and real-time data.
- Optimizing web performance with code splitting, lazy loading, memoization, and React Suspense.
- Ensuring accessibility compliance following WCAG standards and implementing accessible features in React components.
- Collaborating closely with UI/UX designers to ensure feasibility and high-quality visual implementation.
- Maintaining cross-browser compatibility (Chrome, Firefox, Safari, Edge) and troubleshooting browser-specific issues.
- Implementing front-end security best practices to protect against vulnerabilities like XSS and CSRF attacks.
- Leveraging modern frontend tooling and frameworks such as Webpack, Babel, Vite, and Tailwind CSS for efficient development workflows.

Experience

- Development and Maintenance of “DC One City Business Portal” for the District of Columbia Regulatory Authority (DCRA).
- Special Olympics Generation Unified Mobile Application.

Education and Certifications

- B. Tech in Computer Science and Engineering from Manav Rachna International University, Haryana, India.

9.1.1.4 Back-end Developer

Anupam Chowdhury

Background and Relevant Experience

Anupam is a seasoned backend developer with over 12 years of experience designing and implementing scalable, high-performance server-side systems using Node.js and modern backend technologies. He has expertise in Node.js, Express.js, NestJS, MongoDB, PostgreSQL, Kafka, Redis, and REST/GraphQL APIs, enabling him to build secure, efficient, and scalable backend architectures for enterprise, startup, and non-profit digital transformation projects. Anupam has a proven track record of delivering complex enterprise solutions, ensuring system reliability, security, and performance optimization. His experience includes working with federal, private enterprise, and non-profit organizations, helping them streamline backend infrastructure to support scalable and innovative digital initiatives.

Key Expertise and Achievements

- Collaborates closely with clients to gather and analyze requirements, ensuring backend architectures align with business objectives and user needs.
- Specialized in designing and implementing scalable backend systems using Node.js, Express.js, NestJS, Kafka, Redis, MongoDB, PostgreSQL, and other modern technologies.
- Coordinates with development teams, UI/UX designers, and product managers to ensure backend infrastructure meets technical and functional requirements.
- Proficient in designing and developing RESTful and GraphQL APIs, ensuring services are optimized for platform and device compatibility.
- Reviews system architecture and backend workflows regularly, identifying opportunities for scalability, performance improvement, and efficiency.
- Provides technical guidance, supports team development, and fosters innovation and best practices in backend development.
- Led backend modernization projects for private enterprises and non-profits, optimizing workflows, integrating scalable microservices, and implementing cloud-ready digital solutions.

Experience

- Payday Loan Application for IndiaMoneyMart.
- Credit Management Application for Midland Credit Management.

Education and Certifications

- B. Tech in Information Technologies from Kalyani Govt. Engineering College, West Bengal, India

9.1.1.5 AI/ML Engineer

Sanmati Jain

Background and Relevant Experience

Sanmati is a seasoned AI/ML and Data Science leader with over 14 years of progressive experience. He has successfully delivered enterprise-scale Generative AI and machine learning solutions across government, fintech, retail, media, and healthcare domains. Sanmati combines deep hands-on expertise in Machine Learning, Generative AI, NLP, Computer Vision, and MLOps with proven success in aligning AI strategies with business goals. He has also driven innovation in blockchain integration, data engineering, and AI governance frameworks. His ability to mentor cross-functional teams and architect secure, scalable AI systems makes him a strong asset for organizations pursuing digital transformation.

Key Expertise and Achievements

- Driving enterprise-wide AI and Data Science strategies with a focus on Generative AI, NLP, and AI governance.
- Leading cross-functional global teams to deliver large-scale AI/ML solutions across industries.
- Architecting solutions involving LLM fine-tuning, RAG pipelines, vector search optimization, and secure AI deployments.
- Developing MLOps pipelines with AWS SageMaker, MLFlow, and Databricks for scalable production deployments.
- Building recommendation engines, demand forecasting models, NLP pipelines, and computer vision solutions serving millions of users.
- Setting up AI Centers of Excellence to promote innovation, reusable accelerators, and ethical AI practices.
- Integrating blockchain with AI systems, leveraging Solidity, ZK Proofs, and smart contracts for enterprise applications.

Past Experience

- Designed predictive modeling and segmentation, improving engagement and retention with scalable AWS SageMaker deployment for Customer 360
- Implemented a multilingual document translation engine for Cloudwards, USA
- Delivered survival analysis models for cardiovascular risk assessment onsite for the Department of Health, Abu Dhabi.

Education and Certifications

- M.Tech in Technology & Development – IIT Bombay
- B.Tech in Information Technology – Rai Foundation College

9.1.1.6 Data Engineer

Vivekanand Chougale

Background and Relevant Experience:

Vivekanand is an accomplished Data Engineer with 5+ years of experience designing and delivering enterprise-grade data pipelines and ETL solutions. He specializes in building end-to-end workflows using Python, PySpark, SQL, and AWS cloud services to transform raw data into actionable insights. Skilled in AWS Glue, EMR, S3, Redshift, and Athena, Vivekanand has successfully developed robust data lakes and data warehouses that power analytics, reporting, and business intelligence.

He brings expertise in workflow orchestration with Apache Airflow, ensuring scalable and automated data movement across environments. Adept at collaborating with cross-functional teams, he has a proven ability to ensure accuracy, optimize performance, and deliver solutions aligned with business needs. Recognized for quick adaptability and a strong problem-solving mindset, Vivekanand consistently drives innovation, efficiency, and reliability in data engineering projects.

Key Expertise and Achievements:

- Designed and implemented end-to-end ETL pipelines with AWS Glue, EMR, PySpark, S3, and Redshift.
- Orchestrated workflows using Apache Airflow, enabling automation and scalability of data processes.
- Conducted data validation and testing with Athena, ensuring high data quality and trust in analytics.
- Proficient in Python, SQL, and PySpark for large-scale data processing and transformation.
- Experienced with Big Data technologies: Apache Spark, Hadoop.
- Strong knowledge of data modeling and warehousing concepts, with hands-on in Redshift, Oracle, SQL Server, and RDS.
- Skilled in version control using GitHub and collaborative development practices.
- Delivered solutions that improved KPI dashboards, customer insights, and reporting capabilities.

Past Experience

- **European Packaging Group:** Developed a group-wide data lake, standardized and enriched datasets, and enabled KPI dashboards for analytics and reporting.
- **Tier 1 – European Telco:** Built enterprise data warehouse and automated ETL pipelines with Airflow and Glue; integrated S3, Athena, and Redshift for customer churn prediction and business insights
- **Leading General Merchandise Retailer:** Created retail data ETL pipelines using AWS EMR and Airflow; enabled Redshift reporting, automated workflow monitoring, and Athena-based testing.
- **Top rated Global Cargo Airlines:** Designed SQL and PySpark queries to analyze airline operations; optimized PySpark workflows; validated ingestion jobs for Hive-based data warehouse.

Education and Certifications

- B.Sc. – Pune University

9.1.1.7 Application Architect

Atul Goel

Background and Relevant Experience:

Atul is an accomplished Application Architect with 19+ years of experience in designing and delivering large-scale enterprise applications across diverse industries. He specializes in building high-performance, distributed, and cloud-native systems, with deep expertise in application modernization, microservices architecture, and system integration. Proficient in AWS, Azure, and GCP, he has successfully led several cloud migration, security assessment, and strategy consulting engagements to help organizations achieve scalability, reliability, and cost efficiency.

As an Application Architect, he defines solution blueprints, designs application frameworks, and guides technical teams through the full lifecycle, from concept to deployment. He focuses on architecture design, performance optimization, and alignment with business goals and industry best practices.

Key Expertise and Achievements:

- Architecting and designing enterprise-grade, large-scale distributed applications.
- Leading requirement analysis, system study, and translating business needs into technical solutions.
- Preparing and owning final architecture documentation, technical recommendations, and reports.
- Designing application frameworks, microservices, and integration architectures.
- Planning and strategizing Proof of Concepts (POCs) to validate technical feasibility.
- Defining cloud adoption strategies, including migration, modernization, and optimization.
- Implementing security and compliance frameworks across application layers.
- Collaborating with stakeholders, developers, and project managers to ensure solution integrity.
- Leading performance tuning, scalability planning, and high-availability architecture design.
- Establishing DevOps practices, CI/CD pipelines, and automated build/deployment processes.

Past Experience

- **European Packaging Group:** Developed a group-wide data lake, standardized and enriched datasets, and enabled KPI dashboards for analytics and reporting.
- **Cloud Technology Recommendation (Investment Bank):** Executed POC and recommended optimal GCP technologies.
- **Cloud Technology Recommendation (Investment Bank):** Planned and executed POC for large-scale cloud deployment and technology selection.
- **Reference Data System (Investment Bank):** Developed and managed an application with 100+ services, leading a 10-member team and guiding design and technology choices.

Education and Certifications

- MCA | Panjab University

9.1.1.8 UX Designer

Sumanta Mitra

Background and Relevant Experience

Sumanta is a seasoned and highly experienced UX Designer with over 20 years of expertise in graphic design for web and mobile technology, specializing in digital transformation projects for non-profits and private enterprise clients. His ability to create intuitive, user-centric designs has played a key role in modernizing platforms, improving user engagement, and ensuring seamless digital experiences across devices. Sumanta has successfully designed UI/UX for native and hybrid mobile applications, developed responsive web interfaces, and implemented interactive design elements using HTML, CSS3, JavaScript, and jQuery. With a strong blend of design expertise and technical implementation, Sumanta delivers high-quality digital experiences that align with business goals and user expectations. He is a valuable asset for non-profit digital initiatives and private-sector innovation.

Key Expertise and Achievements

- Illustrating concepts by designing examples based on platform and device compatibility and submitting them for approval.
- Led and developed effective strategies for creative navigation, wireframes, and interactive prototypes while advocating for users' needs and goals.
- Facilitating effective client relationships and advising stakeholders on creative best practices and strategic planning.
- Coordinating with development teams to ensure the design meets technical requirements.
- Leading ideation, concept explorations, digital strategy definition, and solution execution.
- Articulating and justifying conceptual and design choices through persona development, journey mapping, and wireframes.
- Provided creative UI/UX leadership for mobile app and web design, ensuring a frictionless user experience.

Experience

- Design and development of Youth Engagement Mobile Application (Generation Unified) for Special Olympics Unified Champion Schools.
- Development of the Astral app, a standalone companion mobile application for Hughes Network Systems' User Terminal (UT) installation.
- Development and maintenance of “DC One City Business Portal” for the District of Columbia Regulatory Authority (DCRA).
- Development of the web portal and mobile application for World War Memorials for the American Battle Monuments Commission.

Education and Certifications

- BCom (Hons) from Calcutta University, Kolkata, India.
- Advanced Diploma in I-Media from PentaSoft Technologies Ltd, India.

9.1.1.9 DevOps Engineer

Uday Patil

Background and Relevant Experience

Uday Patil is an experienced DevOps Engineer with a strong track record of streamlining software delivery and infrastructure management processes. With a focus on automation, reliability, and scalability, he enables faster and more consistent deployment cycles, helping teams release high-quality software efficiently. Uday brings a deep understanding of DevOps culture and practices, ensuring smooth collaboration between development and operations teams. His proactive approach to system monitoring, incident response, and performance optimization makes him a critical asset in maintaining stable, secure, and high-performing environments throughout the project lifecycle.

Key Expertise and Achievements

- Designing and maintaining CI/CD pipelines for automated application build, test, and deployment using tools like Jenkins, GitLab CI, Azure DevOps, and GitHub Actions.
- Managing infrastructure provisioning through Infrastructure as Code (IaC) using Terraform, AWS CloudFormation, and Ansible to ensure consistency and repeatability across environments.
- Monitoring system performance and availability with tools such as Prometheus, Grafana, ELK Stack, and Datadog, and setting up proactive alerts to ensure reliability.
- Administering and optimizing cloud infrastructure across AWS, Azure, and GCP, ensuring scalability, security, and cost-effectiveness in hosting applications.
- Collaborating with development, QA, and security teams to integrate DevSecOps practices and embed security throughout the CI/CD pipeline.
- Developing and maintaining automation scripts for build, deployment, monitoring, and operations using Shell, Python, and PowerShell.
- Creating and managing containerized environments using Docker and orchestrating deployments with Kubernetes, Amazon ECS, and EKS.
- Implementing version control best practices, enforcing branching strategies, and conducting code quality checks using Git and review tools.

Experience

- Design and Development of Youth Engagement Mobile Application (Generation Unified) for Special Olympics Unified Champion Schools
- Development of Low code No code/codeless automation framework
- Development of an application for ERP system of university management for BAU

Education and Certifications

- MCA in Computer Application | Kavayitri Bahinabai Chaudhari North Maharashtra University
- BCA in Computer Application | Kavayitri Bahinabai Chaudhari North Maharashtra University

9.1.1.10 QA Engineer

Aditi Saxena

Background and Relevant Experience

Aditi is a highly skilled Software Quality Engineer with over nine years of experience ensuring the delivery of high-quality software products across various platforms. She specializes in designing and implementing robust test strategies, leading cross-functional teams, and driving process improvements to ensure the highest quality standards in the software development lifecycle. She has extensive experience in Quality Assurance (QA) for SFDC, mobile apps, web-based and client-server applications, and web services. Her expertise extends to supporting digital transformation initiatives for both non-profit organizations and private enterprise clients, where she has been instrumental in modernizing systems, improving product reliability, and ensuring seamless integration.

Key Expertise and Achievements

- Leading end-to-end test execution and management activities for the entire project.
- Creating and maintaining test plans and providing test estimations.
- Creating and reviewing test suites based on requirements to validate the application's functionality.
- Executing the entire software testing life cycle from requirement analysis to QA signoff and UAT support.
- Conducting thorough functional, regression, and performance testing on various software applications, ensuring compliance with industry standards and client requirements.
- Collaborating with development teams to identify, report, and resolve software defects promptly, leading to improved product stability.
- Creating test strategy and test data and identifying and updating quality metrics.

Past Experience:

- Design and development of Youth Engagement Mobile Application (Generation Unified) for Special Olympics Unified Champion Schools.
- Development and testing of RFID asset tracking web applications and tablet devices for OMNI ID.
- Life event management web application testing for Lifecare.
- Cloud platform web application testing for UP Safety.

Education and Certifications

- MCA from Guru Gobind Singh Indraprastha University, Delhi, India.
- BCA from Guru Gobind Singh Indraprastha University, Delhi, India.

10 Examples of Prior Work and References

At Inadev, we specialize in crafting transformative digital platforms that elevate user engagement, streamline operations, and drive sustainable growth. Our proven track record spans impactful collaborations with federal agencies, non-profit institutions, and private enterprises - each partnership rooted in trust, innovation, and measurable success. To name a few we have engaged with the Special Olympics, Department of Licensing and Consumer Protection (DLCP), Internal Revenue Service (IRS), Massachusetts League of Community Health Centers (MLCHC), International AntiCounterfeiting Coalition (IACC), National Telecommunications and Information Administration (NTIA), American Battle Monuments Commission (ABMC), Canadian fintech company 8Twelve, Midland Credit Management (MCM), Universal Sompo General Insurance, Zeus Packaging, Singapore Airlines (SIA), and others. These engagements highlight our ability to design and maintain scalable, secure, and future-ready digital and data platforms across industries and geographies.

10.1 Project 1: Centralized Data and Analytics Platform for Leading European Packaging Provider

Our Client, a global leader in sustainable and innovative packaging solutions, operates across 75+ entities worldwide with a presence in Europe, North America, and beyond. The group serves diverse industries, including food, retail, healthcare, and logistics. With rapid expansion through acquisitions and organic growth, client needed a modern, collaborative data platform to consolidate and harmonize financial, sales, and operational data—while enabling future innovation through AI and advanced analytics.

10.1.1 Existing Challenges

Client Group's global operations were hindered by:

- **Fragmented Data Sources:** 75+ entities running on multiple ERP systems (SAP, Kernel, Xero, etc.), creating silos.
- **Inconsistent KPIs:** Lack of a single source of truth led to discrepancies across geographies and business units.
- **Limited Scalability:** Existing reporting methods could not support growth or advanced analytics.
- **Disconnected Dashboards:** Multiple BI systems lacked consistency, limiting comparative insights.

The client required a centralized data platform that could:

- Integrate diverse ERP and operational data into a unified model.
- Deliver standardized, scalable reporting across global entities.
- Provide a foundation for AI-driven analytics, synthetic data pilots, and collaboration across multiple stakeholders.

10.1.2 Solution Features

Inadev designed and delivered a centralized, cloud-native Data Lake with a future-proof architecture to serve as a collaborative data hub. Key features included:

1. **Layered Data Architecture**
    - Implemented Bronze, Silver, Gold, and Platinum layers for ingestion, cleansing, harmonization, and analytics-ready data.
    - Established governance rules to ensure data quality, consistency, and auditability across all global entities.
2. **Automated Data Ingestion & ETL**
    - Built standardized ingestion pipelines to integrate multiple ERP and third-party sources.
    - Applied harmonization rules to create a unified global data model.
    - Automated workflows mirrored cloud-native orchestration tools (AWS Glue style), ensuring scalability and traceability.
3. **Reporting and Dashboards**
    - Developed a Power BI reporting layer with standardized dashboards across finance, sales, and operations.
    - Delivered near real-time consolidated KPIs, accessible securely across business units.
4. **Future-Ready Capabilities**
    - Architected the platform as a foundation for AI-driven applications such as demand forecasting, synthetic data generation, and conversational analytics.
    - Positioned the solution to support fairness and compliance checks, ensuring future AI applications meet regulatory and ethical standards.

10.1.3 Business Outcomes

- **Single Source of Truth:** Unified data across 75+ global entities, eliminating silos.
- **Standardized KPIs:** Delivered consistent, trusted reporting across geographies.
- **Improved Decision-Making:** Leadership gained near real-time insights through consolidated dashboards.
- **Operational Efficiency:** Automated pipelines reduced manual consolidation effort and reporting delays.
- **Future Scalability:** Platform is now ready to support AI-driven analytics, synthetic data pilots, and enterprise-scale predictive modeling.

10.2 Project 2: Predictive BI and Analytics Platform for a Leading Insurer

10.2.1 Overview

A large-scale private Insurer sought to modernize its business intelligence capabilities by moving beyond descriptive dashboards to predictive and proactive analytics. The aim was to empower business teams with deeper insights, early risk detection, and accessible tools for decision-making without heavy reliance on technical specialists.

10.2.2 Client Challenge

- Existing BI dashboards were static and descriptive, offering only a retrospective view.
- Lack of predictive forecasting limited visibility into premium collections, policy renewals, and claims trends.
- Fraud detection was reactive, making it difficult to mitigate risks before escalation.
- Business stakeholders struggled with technical interfaces, leading to dependency on data teams for insights.

10.2.3 Solution Features

Inadev designed and deployed a predictive BI and analytics platform that delivered real-time forecasting, anomaly detection, and self-service analytics capabilities:

1. **Predictive Modeling**
    - Implemented time-series forecasting models (ARIMA, Prophet, LSTM) to predict collections, renewals, and claims.
    - Enabled proactive decision-making through near real-time forecast dashboards.
2. **Anomaly Detection and Risk Monitoring**
    - Integrated algorithms to identify unusual claim activity, fraud signals, and operational anomalies.
    - Configured alert mechanisms for business teams to act on risks early.
3. **Conversational BI Interface**
    - Developed a chatbot interface (Angular + Python) that allowed business users to query KPIs and forecasts conversationally.
    - Lowered the barrier for non-technical users to access predictive analytics.
4. **Automated Predictive Dashboards**
    - Delivered Power BI dashboards with integrated forecasting and visual alerts.
    - Dashboards refreshed dynamically from the predictive models hosted on AWS.

5. **Cloud-Native Deployment**
    - Leveraged AWS S3 for data storage, AWS Lambda for serverless orchestration, and AWS Batch for model training.
    - Ensured scalability and seamless integration with existing BI workflows.

10.2.4 Business Outcomes

- **Real-Time Predictive Insights:** Forecasts on claims, renewals, and collections enabled proactive planning.
- **Fraud and Risk Mitigation:** Early anomaly detection improved fraud prevention and operational reliability.
- **Self-Service Empowerment:** Business teams accessed predictive dashboards and insights directly, reducing dependency on IT/data teams.
- **Operational Efficiency:** Automation of analytics pipelines accelerated reporting and freed up analysts for higher-value tasks.

10.3 Project 3: Secure Data Exchange Platform for Multi-Enterprise Collaboration

10.3.1 Overview

Inadev partnered with a consortium of the world's largest e-commerce retailers, established under the National Intellectual Property Rights Coordination Center (a division of the U.S. Department of Homeland Security). The consortium's goal was to build a secure data exchange platform to share information on counterfeit networks across major marketplaces and collaboratively combat fraudulent activity.

10.3.2 Client Challenges

Counterfeit networks operate at scale, exploiting multiple digital channels and evolving rapidly. Traditional, siloed approaches to enforcement made it difficult for each marketplace to respond effectively. The client required:

- A real-time, API-driven data ingestion platform that could accept multiple types of input.
- A role-based, secure environment to manage sensitive business data across competing organizations.
- A reporting and dashboarding system that anonymized inputs but delivered actionable intelligence.
- 24/7 reliability and security compliance, given the platform's use for national-level enforcement.

10.3.3 Solution Features

Inadev designed and implemented a cloud-native, role-based data exchange platform with features as follows:

1. **Data Ingestion and Processing**
    - Enabled both manual entry and bulk ingestion via secure APIs.
    - Built ETL pipelines for validation, anonymization, and transformation of incoming records.
    - Supported streaming event notifications for near real-time data flow.
2. **Dashboards and Reporting**
    - Designed anonymized, role-based reports accessible through secure portals.
    - Delivered operational dashboards that allowed members to identify repeat offenders across marketplaces without revealing proprietary data.
3. **Security and Compliance**
    - Implemented role-based access control for Super Admins, Admins, and standard users.
    - Data was fully anonymized to protect participant confidentiality.
    - Delivered on FedRAMP compliance standards, ensuring high security for sensitive datasets.
4. **APIs and Integration**
    - Built external APIs for automated data sharing with member systems.
    - Provided streaming notifications to downstream applications for proactive action.
5. **User Experience and Accessibility**
    - Responsive web design for access across devices.
    - Designed intuitive portals for both data ingestion and reporting.

10.3.4 Business Outcomes

- **Real-Time Collaboration:** Enabled consortium members to share intelligence seamlessly, with ingestion and reporting available within minutes.
- **Stronger Enforcement:** Aggregated and anonymized reporting allowed members to identify and act on counterfeiters more effectively.
- **Scalability and Reliability:** Cloud-native architecture ensured continuous uptime and supported rapid onboarding of new marketplaces.
- **Security and Trust:** Role-based access, anonymization, and FedRAMP compliance-built confidence among participants to share data securely.

10.4 Client References:

Reference 1:

Organization Name:	**Massachusetts League of Community Health Centers**
Contact Person:	Joe Atchinson
Designation:	Vice President
Email:	JAtchinson@massleague.org
Website Address	https://ma-repay.massleague.org/

Reference 2:

Organization Name:	**District of Columbia, Department of Buildings**
Contact Person:	Philip Bender
Designation:	Chief Information Officer
Email:	phil.bender@dc.gov
Website Address	https://dob.dc.gov/

Reference 3:

Organization Name:	**8Twelve Mortgage Corp.**
Contact Person:	Anish Agrawal
Designation:	VP of Software Engineering
Email:	anish@8twelve.mortgage
Website Address	https://8twelve.mortgage

11 W-9 Form

Form **W-9**
(Rev. October 2018)
Department of the Treasury
Internal Revenue Service

Request for Taxpayer Identification Number and Certification

▶ Go to *www.irs.gov/FormW9* for instructions and the latest information.

Give Form to the requester. Do not send to the IRS.

Print or type. See Specific Instructions on page 3.

1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank.
Inadev Corporation

2 Business name/disregarded entity name, if different from above

3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only **one** of the following seven boxes.

☐ Individual/sole proprietor or single-member LLC ☐ C Corporation ☑ S Corporation ☐ Partnership ☐ Trust/estate

☐ Limited liability company. Enter the tax classification (C=C corporation, S=S corporation, P=Partnership) ▶ _____

Note: Check the appropriate box in the line above for the tax classification of the single-member owner. Do not check LLC if the LLC is classified as a single-member LLC that is disregarded from the owner unless the owner of the LLC is another LLC that is **not** disregarded from the owner for U.S. federal tax purposes. Otherwise, a single-member LLC that is disregarded from the owner should check the appropriate box for the tax classification of its owner.

☐ Other (see instructions) ▶

4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):
Exempt payee code (if any) _____
Exemption from FATCA reporting code (if any) _____
(Applies to accounts maintained outside the U.S.)

5 Address (number, street, and apt. or suite no.) See instructions.
11921 Freedom Dr. STE 920

Requester's name and address (optional)

6 City, state, and ZIP code
Reston, VA 20190

7 List account number(s) here (optional)

Part I Taxpayer Identification Number (TIN)

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see *How to get a TIN*, later.

Note: If the account is in more than one name, see the instructions for line 1. Also see *What Name and Number To Give the Requester* for guidelines on whose number to enter.

Social security number
___ - ___ - ____

or

Employer identification number
54 - 2018793

Part II Certification

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

Certification instructions. You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

Sign Here Signature of U.S. person ▶ Will Mosely Date ▶ 04/09/2025

General Instructions

Section references are to the Internal Revenue Code unless otherwise noted.

Future developments. For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to *www.irs.gov/FormW9*.

Purpose of Form

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following.

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, *later.*

Cat. No. 10231X Form **W-9** (Rev. 10-2018)

12 Attachment B

Massachusetts Technology Collaborative
Authorized Respondent's Signature and Acceptance Form

The undersigned is a duly authorized representative of the Respondent listed below. The Respondent has read and understands the RFP requirements. The Respondent acknowledges that all of the terms and conditions of the RFP are mandatory, and that Respondent's response is compliant with such requirements.

The Respondent understands that, if selected by the Mass Tech Collaborative, the Respondent and the Mass Tech Collaborative will execute an Agreement specifying the mutual requirements of participation.

Respondent agrees that the entire bid response will remain valid for sixty (60) days from receipt by the Mass Tech Collaborative.

I certify that Respondent is in compliance with all corporate filing requirements and State tax laws.

I certify that the statements made in this response to the RFP, including all attachments and exhibits, are true and correct to the best of my knowledge.

I acknowledge and understand the procedures for handling confidential materials submitted to the Mass Tech Collaborative as set forth in Section 3.1(d); I agree to be bound by those procedures and agree that the Mass Tech Collaborative shall not be liable under any circumstances for the disclosure of any materials submitted to the Mass Tech Collaborative pursuant to this RFP or upon the Respondent's selection.

Respondent: Jitesh Sachdev

(Printed Name of Respondent)

By:

(Signature of Authorized Representative)

Name: Jitesh Sachdev

Title: Chief Executive Officer

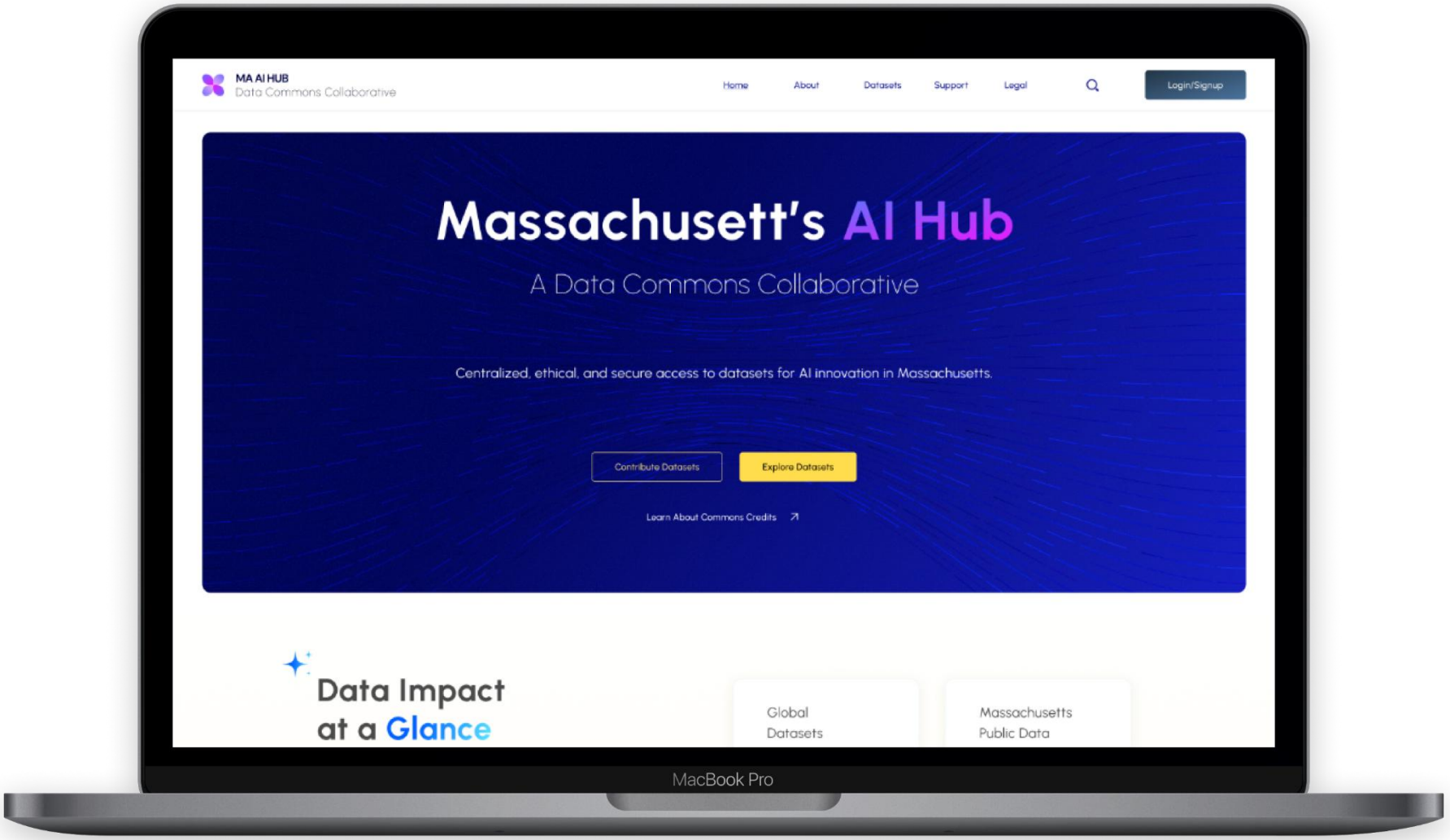
Date: 07-10-2025

13 Requirement Compliance Matrix

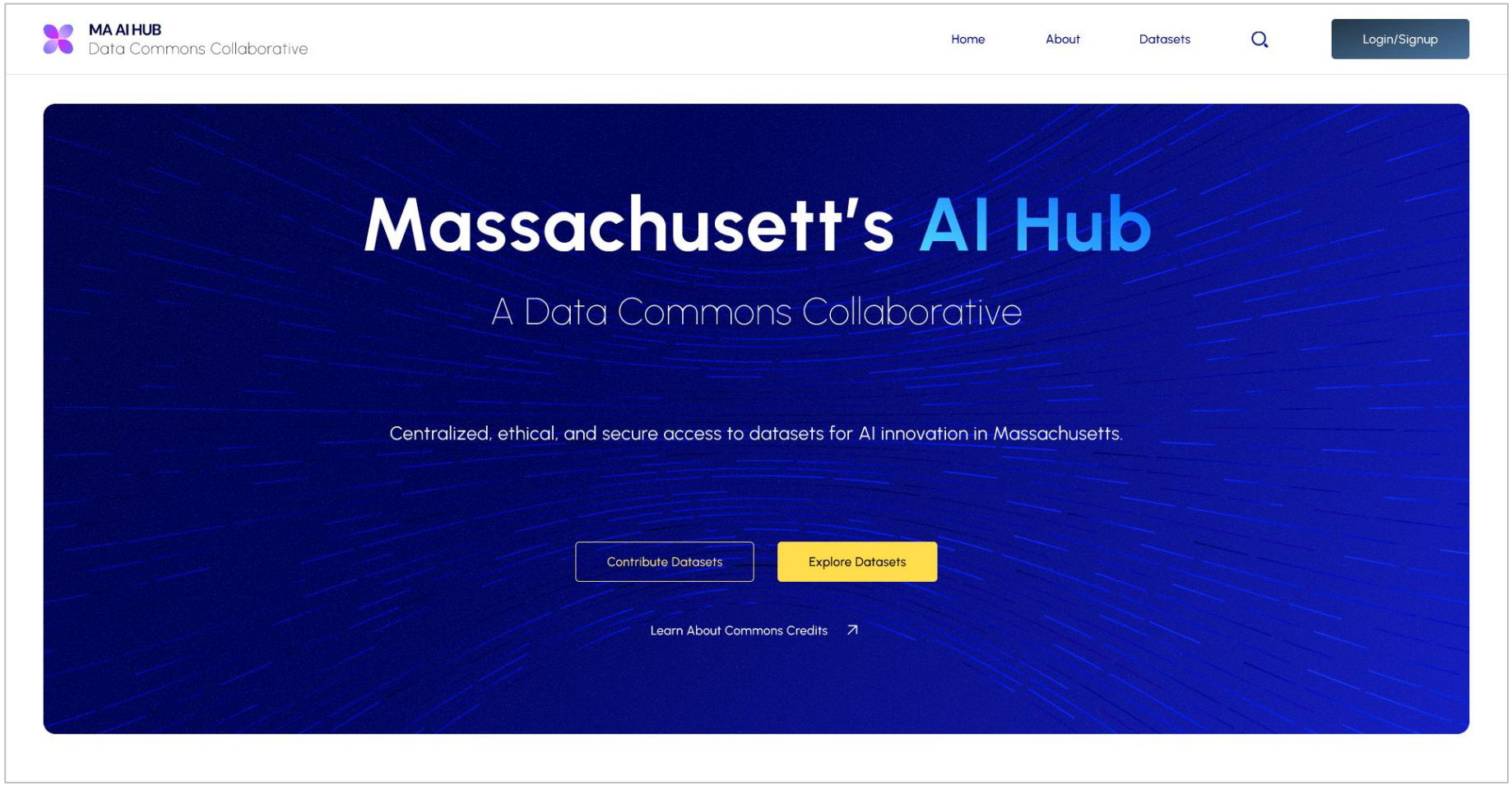
Sr No.	Requirements	Compliance (Yes/No)
1	Design and build the data commons website and backend infrastructure.	Yes
2	Implement metadata management, cataloging, and discovery tools (e.g., CKAN, Dataverse).	Yes
3	Develop role-based access and identity management system.	Yes
4	Develop a central ledger for tracking “Commons Credits”.	Yes
5	Enable API-based data access and usage analytics.	Yes
6	Assist in curating the initial set of datasets and ensure metadata completeness with FAIR principles.	Yes
7	Support data ingestion pipelines, version control, and provenance tagging.	Yes
8	Integrate synthetic data tools (e.g., SDV, Synthea, CARLA) and support generation/validation pipelines.	Yes
9	Ensure synthetic data compliance with privacy and audit policies.	Yes
10	Implement bias detection, auditing, and mitigation tools (e.g., AIF360, Fairlearn).	Yes
11	Establish bias impact documentation workflows and dashboards.	Yes
12	Define and implement RBAC, MFA, dataset tiering, logging, encryption, and audit trails.	Yes
13	Define terms of use and enforce ethical data handling.	Yes
14	Train end users and administrators, prepare documentation and support materials.	Yes
15	Provide a searchable dataset directory with filters by type, source, domain, format, and license.	Yes
16	Create dataset detail pages with metadata, related datasets, and external links.	Yes
17	Include sections for public datasets, synthetic data tools, and Massachusetts public datasets with links and descriptions.	Yes
18	Support community dataset submissions and user feedback forms.	Yes
19	Provide an admin dashboard for managing datasets, links, and user suggestions.	Yes

Sr No.	Requirements	Compliance (Yes/No)
20	Ensure website accessibility (WCAG 2.1), performance, security, responsiveness, and modular architecture.	Yes
21	Host datasets with searchability, download in machine-readable formats, APIs, version control, and previews.	Yes
22	Implement user experience enhancements like filters, access requests, and explorers.	Yes
23	Design a secure ledger for Commons Credits issuance, tracking, earning, spending, and governance.	Yes
24	Support metadata management, dataset discovery, access control, publishing, collaboration, and previews in the data catalog.	Yes
25	Implement governance requirements including core capabilities, operational needs, HIPAA compliance, monitoring, and education.	Yes
26	Ensure security and access controls with authentication, data protection, policies, and ethical guidelines.	Yes

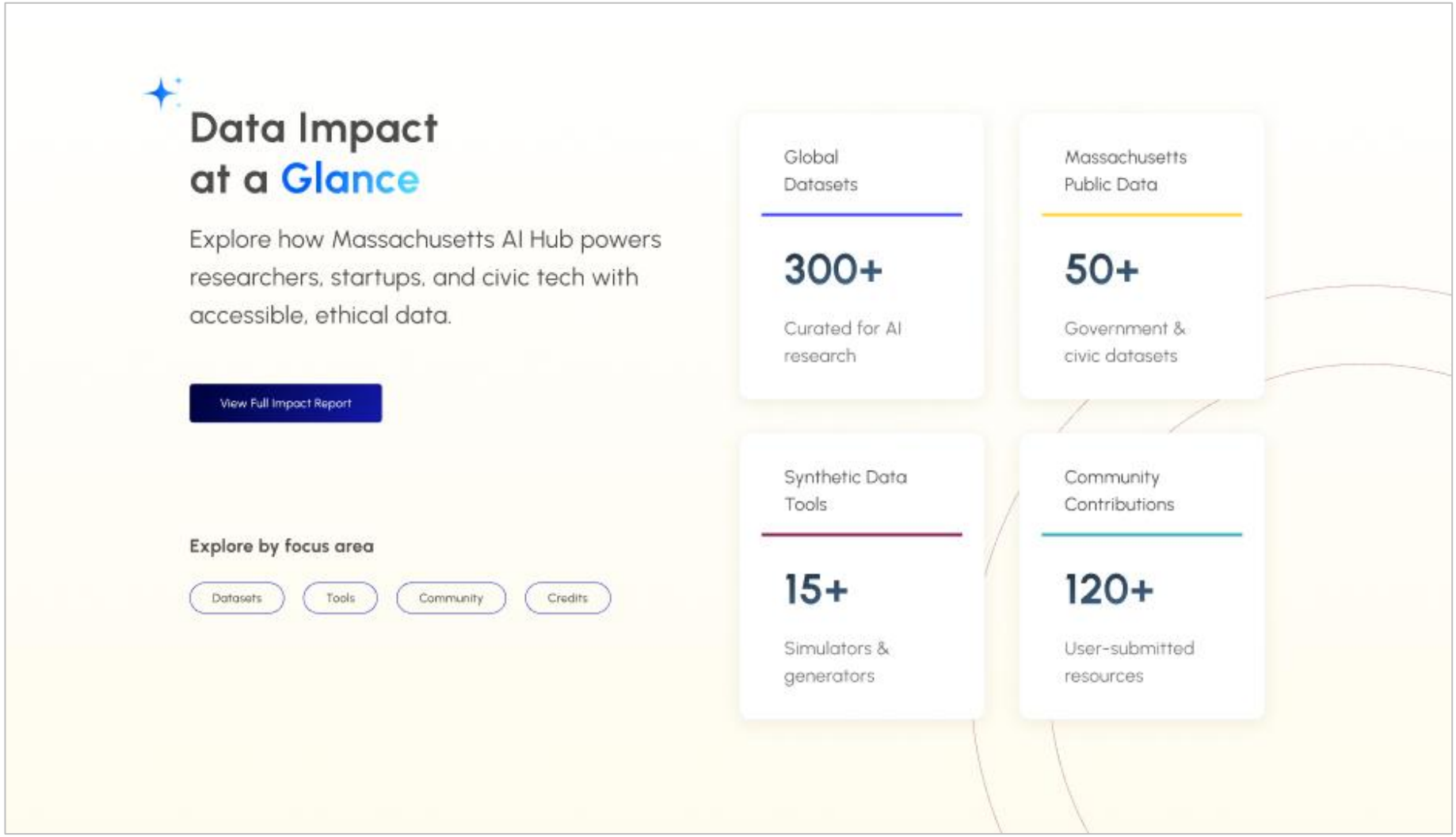
14 Design Mockups



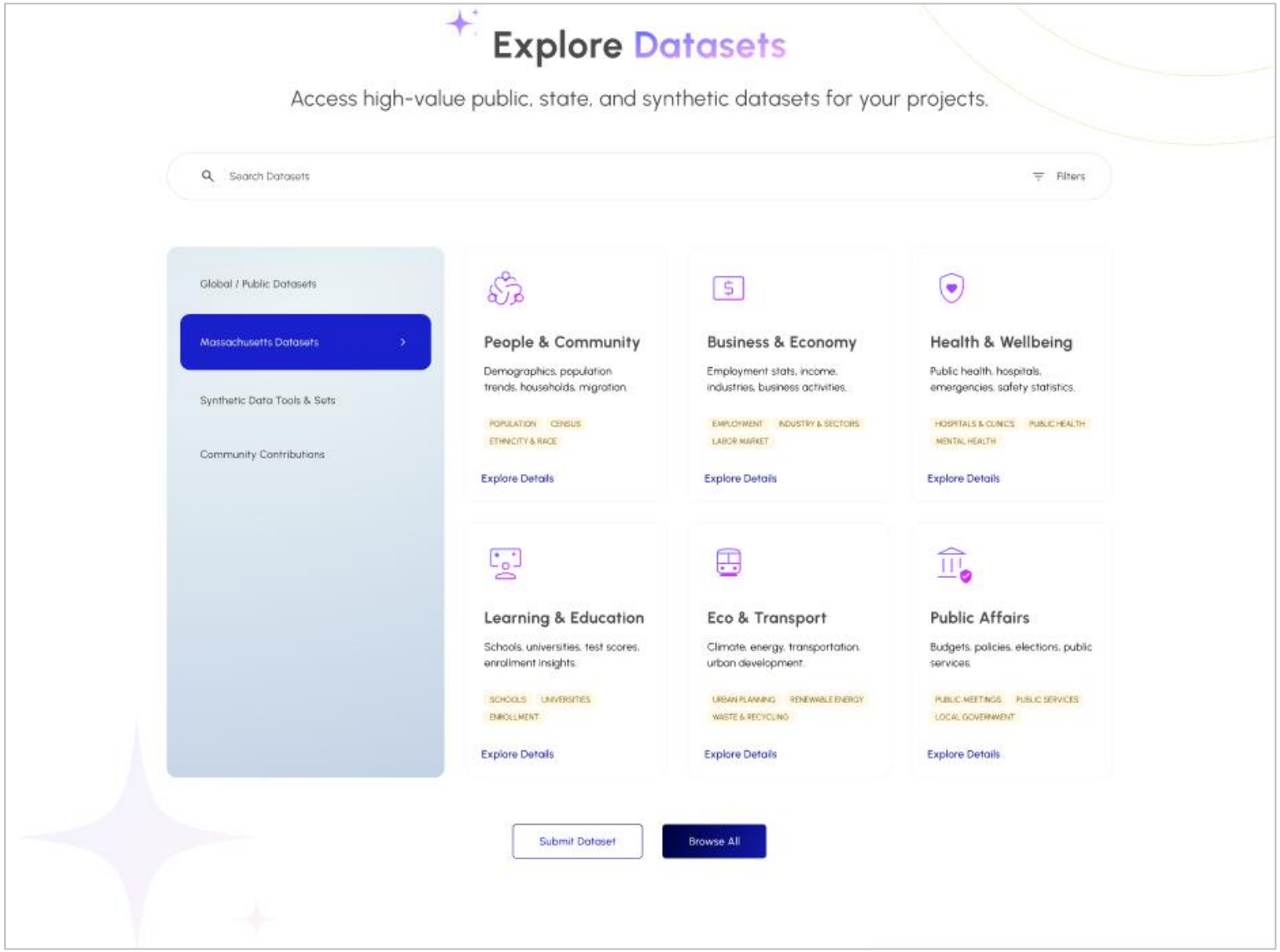
14.1 Home Page



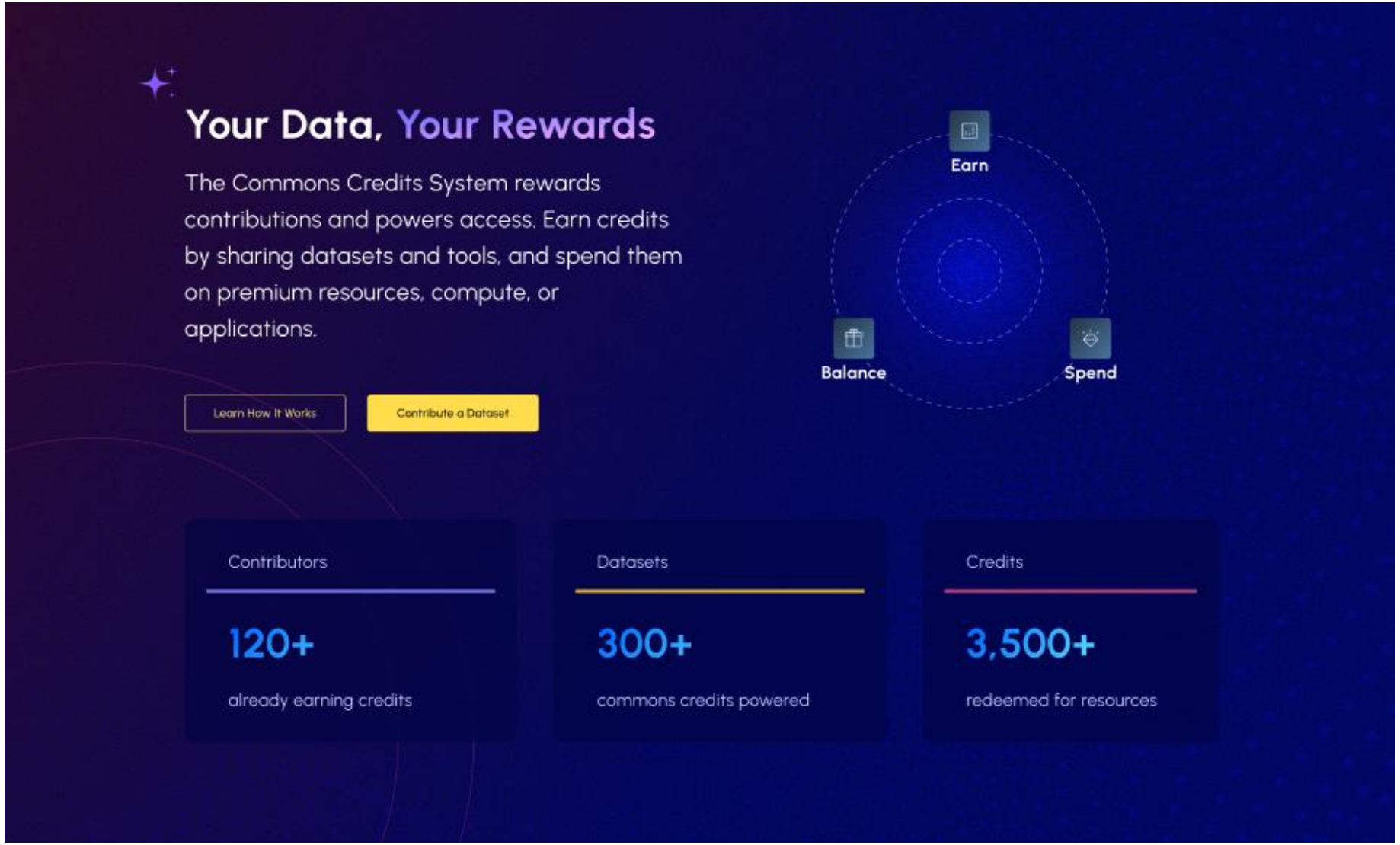
Home Page Continued

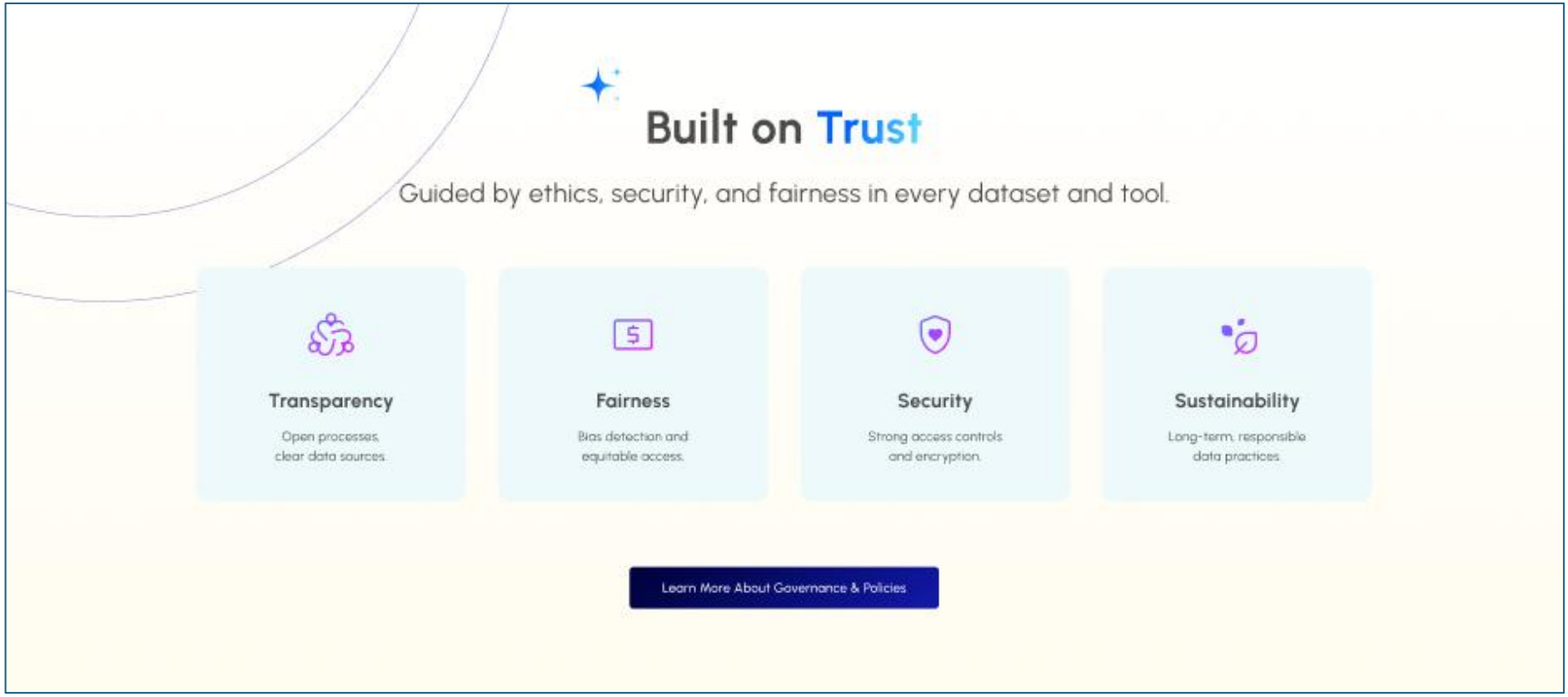


Dataset Page

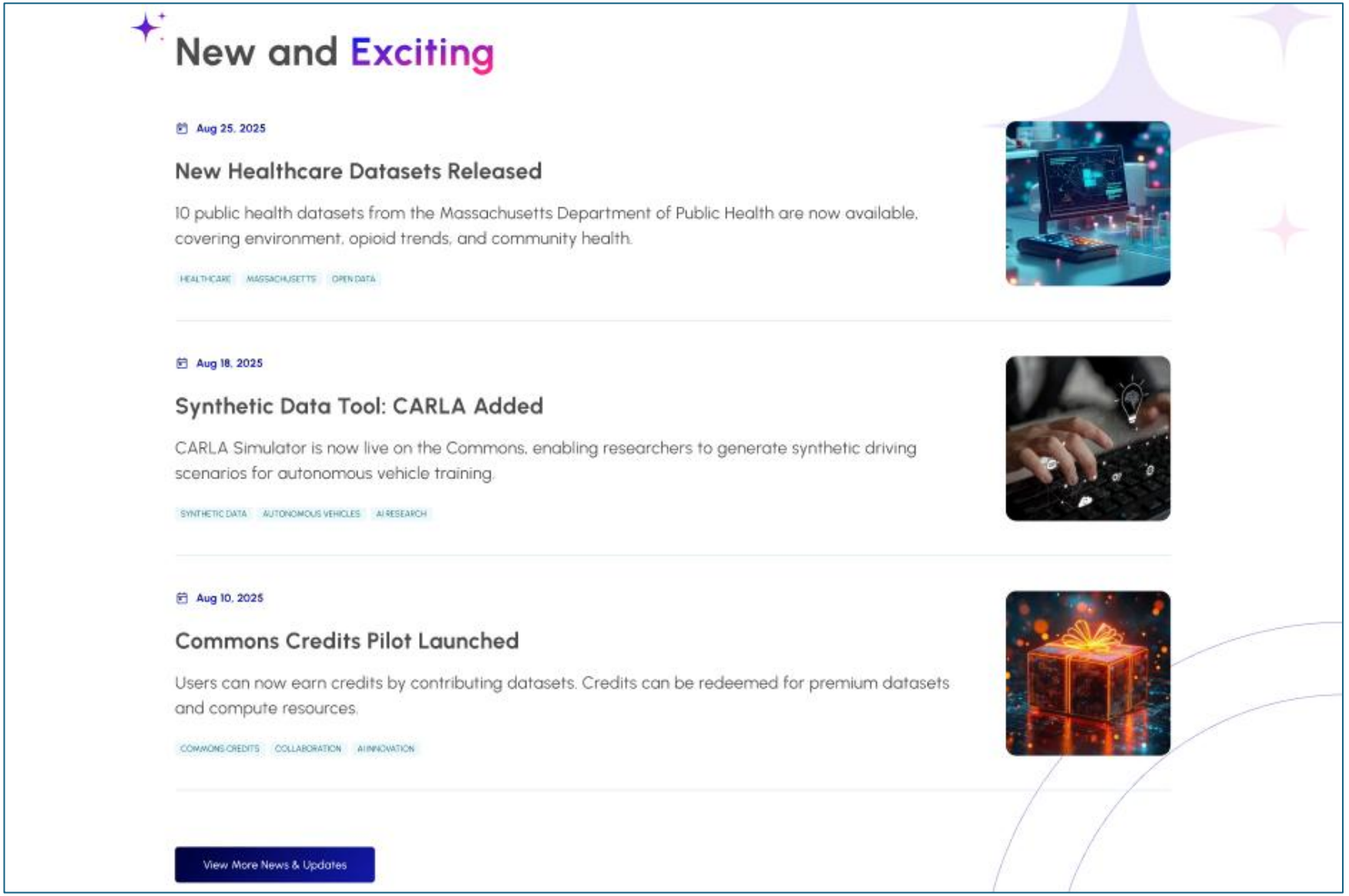


Dataset Page Continued

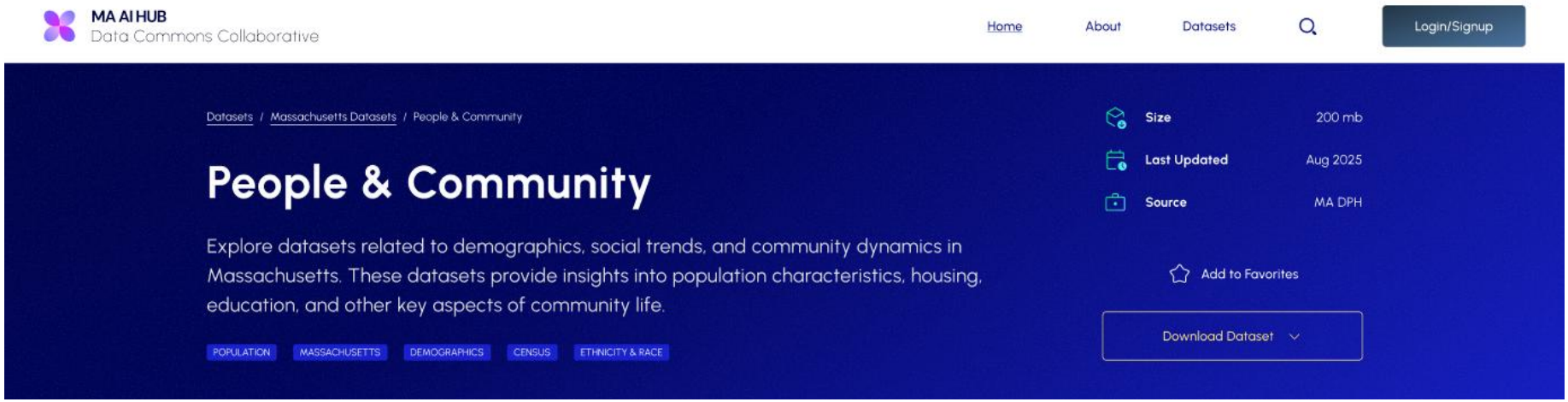


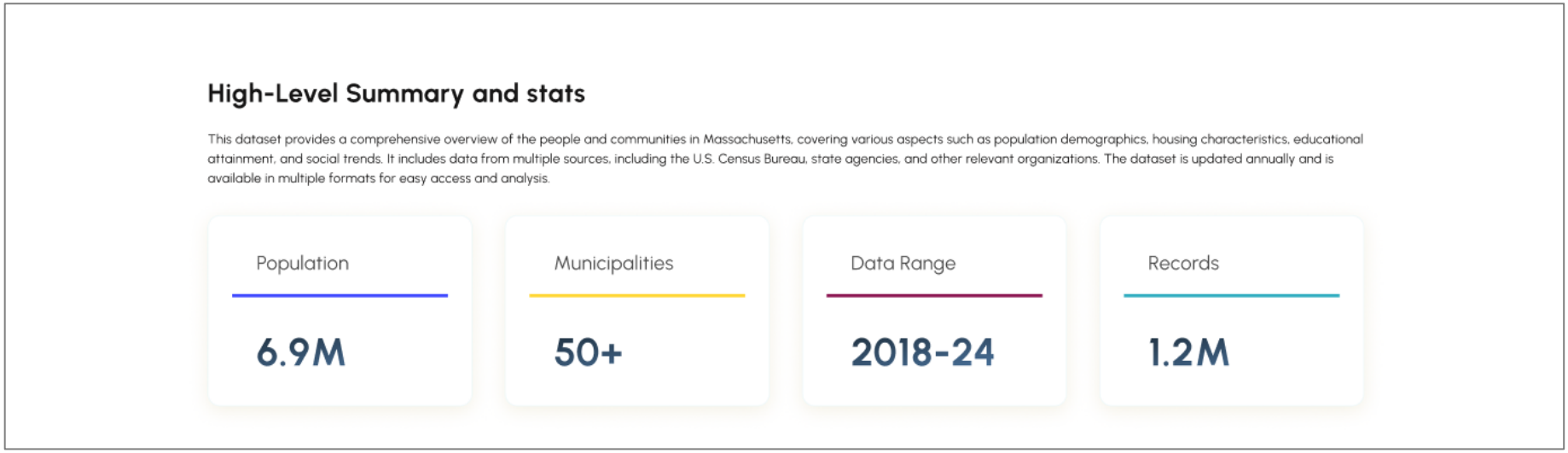

Built on Trust
Guided by ethics, security, and fairness in every dataset and tool.
Transparency
Open processes, clear data sources.
Fairness
Bias detection and equitable access.
Security
Strong access controls and encryption.
Sustainability
Long-term, responsible data practices.
Learn More About Governance & Policies

News Section

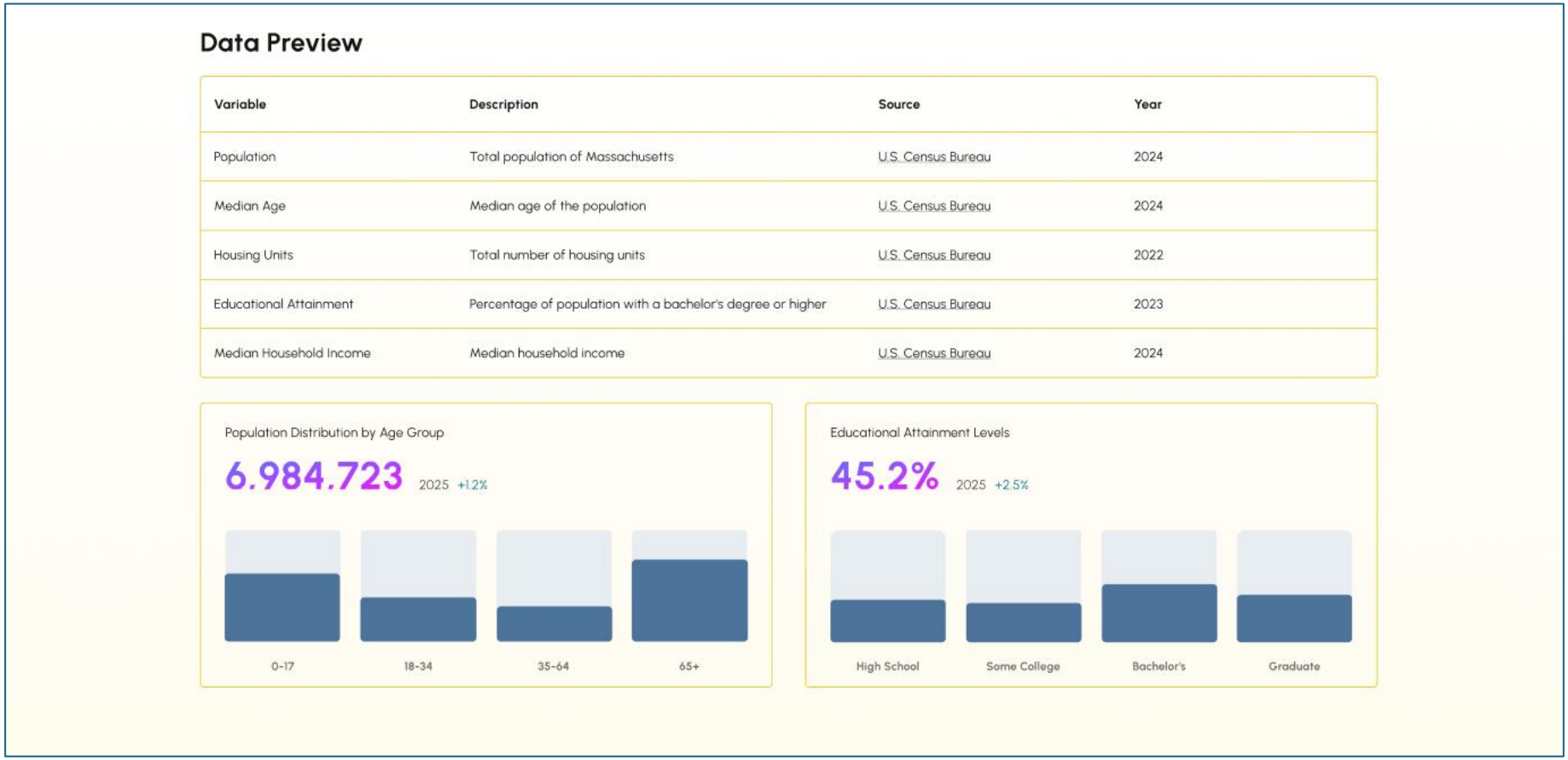

New and Exciting
Aug 25, 2025
New Healthcare Datasets Released
10 public health datasets from the Massachusetts Department of Public Health are now available, covering environment, opioid trends, and community health.
HEALTHCARE
MASSACHUSETTS
OPEN DATA
Aug 18, 2025
Synthetic Data Tool: CARLA Added
CARLA Simulator is now live on the Commons, enabling researchers to generate synthetic driving scenarios for autonomous vehicle training.
SYNTHETIC DATA
AUTONOMOUS VEHICLES
AI RESEARCH
Aug 10, 2025
Commons Credits Pilot Launched
Users can now earn credits by contributing datasets. Credits can be redeemed for premium datasets and compute resources.
COMMONS CREDITS
COLLABORATION
AI INNOVATION
View More News & Updates

Dataset Details

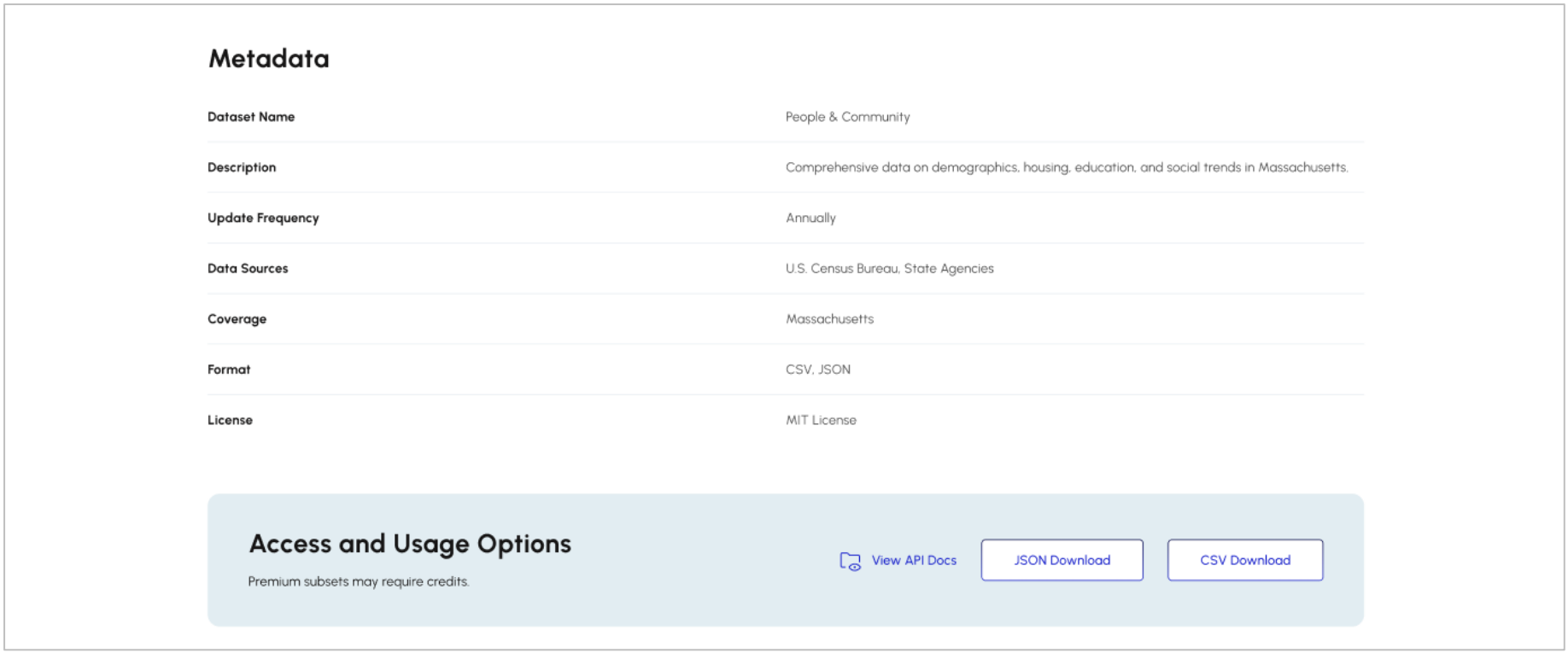



High-Level Summary and stats
This dataset provides a comprehensive overview of the people and communities in Massachusetts, covering various aspects such as population demographics, housing characteristics, educational attainment, and social trends. It includes data from multiple sources, including the U.S. Census Bureau, state agencies, and other relevant organizations. The dataset is updated annually and is available in multiple formats for easy access and analysis.
Population
6.9M
Municipalities
50+
Data Range
2018-24
Records
1.2M

Dataset Preview



Metadata View:



15 Estimation Considerations

S.N.	Module / Feature	Deliverables & Remarks	Assumptions
1.1	Home Landing Page	2 screens, full nav/menus	2 screens, 8+ UI sections, 10+ accessibility features, CMS integration
1.2	Dataset Directory	Cards, pagination, filters	1 main UI, 3 filter APIs, 2 card layouts, search (autocomplete/indexed), 2+ backend queries
1.3	Dataset Detail Page	Metadata, lineage, versioning	Detail page, version compare, 3+ visual widgets, 5+ backend APIs (metadata, download, lineage, history, license)
1.4	Dataset Visualization	Charts, geospatial viz	1 visual UI, 4+ charting libs, 2+ backend APIs for data fetch and format, 1 geospatial rendering
1.5	Data Profiling Preview	Schema, outlier check	1 UI, 2 profiling jobs, summary tables, API for profiling stats, outlier detection, quality heatmap
1.6	Data Curation Workbench	UI, audit trail, schema mgmt	1 main workbench, 5+ APIs (PII, rule mgmt, transformation, audit, version), workflow & batch validation, analytics widget
2.1	Competition Listing	Browse, search, scoring	List UI, 5 competitions, 3 APIs (listing, search, scoring), leaderboard integration
2.2	Community Competitions	Creation, join, scoring	1 form UI, add/join APIs, scoring API, validations, status update, notification triggers
2.3	Competition Overview Detail Page	Leaderboard, progression	Leaderboard, 2 progression visualizations, 2 APIs, notification and summary analytics
2.4	User Ranking	Leaderboard, analytics	Leaderboard page, 3+ analytics widgets, historical trend graph, rank calculation API, download/csv export
2.5	Progression	Timeline, badges, milestones	Timeline UI, badge/level config, 2 backend APIs, notification rules
3.1	Tools Landing	Catalog, featured tools	1 tools home, 12 tool cards, featured carousel, 2+ catalog APIs
3.2	Text Tools	Editor, markdown, NLP	Advanced text editor, markdown preview, 2 NLP APIs, export tools
3.3	Image Tools	Viewer, annotation, ML	1 image tools, annotation UI, ML image API, preview/export, upload integration

S.N.	Module / Feature	Deliverables & Remarks	Assumptions
3.4	Video Tools	Player, annotation, convert	1 custom video player, annotation layer, format conversion, 2 APIs, queue for processing
3.5	Tabular Tools	Grids, stats, APIs, analysis	Data grid UI, 2 tabular processing modules, stats API, file convert, summary/preview tool
3.6	Geospatial Tools	Maps, overlays, spatial API	Map UI, overlay widget, 2 geo APIs (rendering, conversion), upload/preview, ML geo tools
4.1	Notebook Integration	Jupyter, DS UI, session mgmt	1 advanced Jupyter-like UI, 20~30 backend APIs, session/orchestration layer, 4+ kernels, 8 notebook/plugin integrations, ML/DS runtime support, experiment tracking, SHAP/LIME, fairness analytics, model registry, external model API links (HuggingFace, Bedrock, SageMaker), persistent state, collaborative sharing, RBAC, multi-tenant, interactive plotting, kernel sandboxing
4.2	Header / Sub-header	Notebook header, indicators	1 sticky header, 2 indicators/notifications, session status chip, theme switch
4.3	Input/Output/Session/Help	Editor, output, session ctl	1 code editor, cell output UI, 2 session control modules, error parser
4.4	Kernel Selector	Env select, health mgmt	Kernel/environment UI, 3 env configs, health-check API, session reset, runtime storage
4.5	Usage/Credits Screen	Credits, usage, analytics	Credits UI, history chart, usage API, analytics, spend predictor
5.1	Community Submission Tabs/Views	Forms, views, mgmt	1 form UI, 2 roles, role switching UI, submission validation, 2 workflow APIs
5.2	Bulk Upload ETL Monitor	File upload, progress, jobs	Upload UI, progress tracker, multi-file queue, error resolution UI, retry API, job scheduler
5.3	Access Request/Approval Module	Workflow forms, audit	1 approval UI, multi-level workflow, audit/log export, 2 APIs, RBAC checks
5.4	Consent Agreements / Legal UI	Signature, consent	Digital signature widget, 2 forms, consent log table, versioning, export
6.1	Admin Overview / Dashboard	Metrics, role views	Admin UI, 3 role dashboards, 3+ metrics widgets, RBAC, health checks

S.N.	Module / Feature	Deliverables & Remarks	Assumptions
6.2	Dataset Management	CRUD, metadata, access, lineg	CRUD module, 3 APIs, 1 lineage viz, permission workflow, history, versioning
6.3	Submission Review Module	Queue, review, checklist	Review queue UI, reviewer dashboard, checklist widget, doc attachment, bulk approve
7.1	Audit Log Viewer	Logs, categories, export	Audit log UI, split log table, export to CSV/JSON, 2 filters, severity badge, read-only role
7.2	Log Search Filter	Search, filter by kwd/user	Log search page, 3 dedicated filter modules, batch select, keyword highlighter
7.3	Log Export/Visualization	Export, dashboards	Log export job manager, 2 dashboards, data viz widgets, 2 schedule options
7.4	Saved Filters/View Module	Save queries/export	Saved filter UI, user prefs, export/share feature, quick pin/fav
7.5	Role-Based Audit Views	RBAC, compliance, reporting	2 RBAC roles, compliance reporting, redacted audit log, 1 view UI
8.1	Compliance Dashboard	HIPAA/GDPR metrics	Dashboard UI, 2 report types, auto-report generator, compliance rules config
8.2	Policy Dashboard	Governance, dataset mapping	Dashboard UI, 2 policy modules, regulation mapping widget, review queue
9.1	User Profile Access Control	SSO, MFA, profile, history	2+ UI pages (profile, onboarding, security), 12+ APIs (SSO, MFA, RBAC, profile CRUD, session, preference, API key CRUD, audit, provider integration), 3+ identity integrations, audit logging, encryption/compliance, multi-tenant RBAC, user onboarding flows

S.N.	Module / Feature	Deliverables & Remarks	Assumptions
10.1	Reports / Analytics Pages	Analytics, ML tracking	2+ analytics dashboard UIs, custom report builder, scheduled/real-time analytics, 12+ backend/reporting APIs (dataset usage, ML model stats, ETL job performance, cost, quality, KPI, forecast, trend, API usage, citation, resource utilization, engagement), visual widgets (charts, heatmaps, graphs, tables), export/download (PDF, CSV, PNG), comparative analytics, data quality/lineage metrics, alerting, dashboard config/save, user role-based views, report scheduling, multi-source joins, metrics drilldown, interactive explorer, ML/DS integration for custom/statistical/forecast/insight
10.2	Export Reports Auditors	Compliance exports, auditing	Scheduler UI, report config UI, secure export process, audit revision
11.1	Help Documentation Center	FAQs, guides, feedback	Help UI, 12 guides/FAQ articles, feedback widget, in-context help, search
11.2	Multi-language Support	Translation, i18n, ML trans.	i18n switcher, 2 translation APIs, ML/lang lib integration, dynamic UI text, 3 language configs
11.3	UX/Theming/Branding	White-label, branding, access	UI theme switcher, branding asset management, CMS integration, accessibility tuning

End of Document

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Massachusetts Technology Collaborative

Grant Agreement
Standard Budget and Invoice Template
Invoiced Costs

Line Number	Budgeting																	
2	Applicant Information																	
3	Applicant: Inadev Corporation			Procurement No.: 2026-JAII-01														
4	Budget Period: 11 months			Title of Proposed Project: AI Hub Data Commo														
5	Address: 11921 Freedom Drive, Suite 920, Reston, VA, 20190																	
6																		
7																		
8				MTC Funding Re No														
9				Total Project Cost	375,000													
10	Cost Elements				Total Project	Invoice 1		Invoice 2		Invoice 3		Invoice 4		Cumulative				
11						Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY		Period: MM/DD/YYYY-MM/DD/YYYY				
12							Amount		Amount		Amount		Amount	Expended		Remaining		
13	I. Direct Labor																	
14	*name/title*	*HRS*	*Rate*			*HRS*		*HRS*		*HRS*		*HRS*						
15	Project Manager / BA	1760	$40		$70,400		$ -		$ -		$ -		$ -	$ -		$ 70,400.00		
16	Application Architect	480	$45		$21,600		$ -		$ -		$ -		$ -	$ -		$ 21,600.00		
17	Data Scientist / AI/ML Engineer	1000	$40		$40,000		$ -		$ -		$ -		$ -	$ -		$ 40,000.00		
18	Data Engineer	1000	$35		$35,000		$ -		$ -		$ -		$ -	$ -		$ 35,000.00		
19	React js Developer	1360	$35		$47,600		$ -		$ -		$ -		$ -	$ -		$ 47,600.00		
20	Node js Developer	1360	$35		$47,600		$ -		$ -		$ -		$ -	$ -		$ 47,600.00		
21	UX Designer	480	$29		$13,920		$ -		$ -		$ -		$ -	$ -		$ 13,920.00		
22	DevOps Engineer	800	$33		$26,400		$ -		$ -		$ -		$ -	$ -		$ 26,400.00		
23	Quality Analyst	2200	$33		$72,600		$ -		$ -		$ -		$ -	$ -		$ 72,600.00		
24	Total Direct Labor				$375,120	0	$ -	0	$ -	0	$ -	0	$ -	$ -		$ 262,200.00		
25																		
26	II. Direct Labor Fringe Cost	Rate (%):			$0		$ -		$ -		$ -		$ -	$ -		$ -		
27																		
28	II. Subcontractors/Consultants/Contracted Staffing																	
29	*Firm name/title or role/type of services to be provided*	*HRS*	*Rate*			*HRS*		*HRS*		*HRS*		*HRS*						
30					$0		$ -		$ -		$ -		$ -	$ -		$ -		
31					$0		$ -		$ -		$ -		$ -	$ -		$ -		
32					$0		$ -		$ -		$ -		$ -	$ -		$ -		
33					$0		$ -		$ -		$ -		$ -	$ -		$ -		
34					$0		$ -		$ -		$ -		$ -	$ -		$ -		
35					$0		$ -		$ -		$ -		$ -	$ -		$ -		
36	Total Subcontractors/Consultants				$0	0	$ -	0	$ -	0	$ -	0	$ -	$ -		$ -		
37																		
38	III. Direct Materials (provide description and costs basis)																	
39	Curriculum Development & Training				$0										$0		$0	
40					$0										$0		$0	
41					$0										$0		$0	
42					$0										$0		$0	
43					$0										$0		$0	
44					$0										$0		$0	
45					$0										$0		$0	
46	Total Direct Materials				$0		$0		$0		$0		$0	$0		$0		
47																		
48	IV. Travel														$0		$0	
49																		
50	V. Other Direct Costs *(list type and description such as venue rental costs and cost basis)*																	
51														$ -		$ -		
52														$ -		$ -		
53					$0									$ -		$ -		
54					$0									$ -		$ -		
55					$0									$ -		$ -		
56	Total Other Direct Costs				$0		$ -		$ -		$ -		$ -	$ -		$ -		
57																		
58	VI. General & Administrative Expense/Overhead	Rate (%):			$0		$ -		$0		$0		$0	$ -		$0		
59																		
60	**Total PROJECT COSTS**				**$375,120**		**$0**		**$0**		**$0**		**$0**	**$0**		**$262,200**		

LEGEND:

Formula cell
Data entry cell

This section is for post-contract invoicing only. Do not complete with proposal.